RECLAMATION

Managing Water in the West

North Valley Regional Recycled Water Program

Draft

Draft Environmental Impact Report/Statement

SCH# 2014042068 **EA/UP&P No. 2014-02**

U.S. Department of the Interior
Bureau of Reclamation

City of Modesto

January 2015

Mission Statements

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian Tribes and our commitments to island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

North Valley Regional Recycled Water Program
Draft Environmental Impact Statement/Environmental Impact Report

NEPA Lead Agency: United States Department of the Interior, Bureau of Reclamation, Mid-Pacific Region, South-Central California Area Office

CEQA Lead Agency: City of Modesto

Cooperating Agencies: Del Puerto Water District, U.S. Fish and Wildlife Service, NOAA National Marine Fisheries Service

The United States Department of the Interior, Bureau of Reclamation (Reclamation) and the City of Modesto have jointly prepared this Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the North Valley Regional Recycled Water Program (NVRRWP or proposed project).

The City of Modesto, City of Turlock, and Del Puerto Water District (DPWD) (Partner Agencies) propose to implement a regional solution to address water supply shortages in DPWD's service area on the west side of the San Joaquin River in San Joaquin, Stanislaus and Merced Counties, south of the Sacramento-San Joaquin River Delta (Delta). The project would deliver up to 59,000 acre feet per year (AFY) of recycled water produced by the cities of Modesto and Turlock via the Delta-Mendota Canal (DMC), a feature of the Central Valley Project owned by Reclamation. Instead of discharging into the San Joaquin River, recycled water would be conveyed from Modesto and Turlock through pipelines from their wastewater treatment facilities, crossing the San Joaquin River, ending at the DMC. The recycled water would then be conveyed directly to DPWD customers. This project also proposes to provide water to Central Valley Project Improvement Act (CVPIA) designated Refuges located south of the Delta to meet their need for water supply.

The Project Partners have identified two alternatives that use different pipeline alignments to convey water to the DMC. In addition this EIR/EIS evaluates a third alternative, which would continue river discharge, and then divert and convey water to the DMC through expanded facilities owned by the Patterson Irrigation District.

This EIR/EIS assesses potential environmental effects of the NVRRWP alternatives and a No Action Alternative on resources including: aesthetics, air quality, agriculture, biological resources, cultural resources, energy, geology and soils, greenhouse gas emissions, hazards and hazardous materials, hydrology and water quality, land use and planning, noise, population and housing, public services and utilities, recreation, transportation, socioeconomics, environmental justice.

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Acronyms and Abbreviations

AB	Assembly Bill
AF	Acre-feet
AFY	Acre-feet per year
APE	Area of Potential Effect
ASCE	American Society of Civil Engineers
ATCM	Airborne Toxic Control Measure
BA	Biological Assessment
BACT	Best Available Control Technology
BCID	Banta-Carbona Irrigation District
BMPs	Best Management Practices
BNR	Biological Nutrient Removal
BPS	Best Performance Standards
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CAL FIRE	California Department of Forestry and Fire Protection
CalEEMod	California Emissions Estimator Model
CalEPA	California Environmental Protection Agency
CalOSHA	California Division of Occupational Safety and Health
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CBC	California Building Code
CCAA	California Clean Air Act
CCIC	Central California Information Center
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CDOC	California Department of Conservation
CDPH	California Department of Public Health
CEC	California Energy Commission
CECs	Contaminants of Emerging Concern
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act

CESA	California Endangered Species Act
CFNR	California Northern Railroad Company
CFR	Code of Federal Regulations
cfs	cubic feet per second
CGS	California Geological Survey
CHRIS/CCIC	California Historical Resources Information System-Central California Information Center
CNDDB	California Natural Diversity Data Base
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
CO	Carbon monoxide
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
CPUC	California Public Utilities Commission
CRHR	California Register of Historical Resources
CSC	California Species of Special Concern
CSLC	California State Lands Commission
CVP	Central Valley Project
CVPIA	Central Valley Project Improvement Act
CVRWQCB	Central Valley Regional Water Quality Control Board
CWA	Clean Water Act
CY	cubic yards
dB	Decibel
dBA	A-weighted decibel
DMC	Delta-Mendota Canal
DPM	Diesel particulate matter
DPWD	Del Puerto Water District
DTSC	(California) Department of Toxic Substances Control
DWP	(California) Drinking Water Program
DWR	Department of Water Resources
EFH	Essential Fish Habitat
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EMFAC	Emissions factors (model)

EPA	(United States) Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
ERIP	Emission Reduction Incentive Program
ESU	Evolutionarily Significant Unit
FESA	Federal Endangered Species Act
FMMP	Farmland Mapping and Monitoring Program
FPPA	Farmland Protection Policy Act
ft	feet
FWCA	Fish and Wildlife Coordination Act
GAMAQI	Guide for Assessing and Mitigating Air Quality Impacts
GGS	Giant garter snake
GHG	Greenhouse Gas
gpm	Gallons per minute
GRCD	Grasslands Resource Conservation District
GWD	Grasslands Water District
GWP	Global warming potential
H_2O	Water
H_2S	Hydrogen sulfide
HCP	Habitat Conservation Plan
HDD	Horizontal Directional Drilling
HFCs	Hydrofluorocarbons
HMBP	Hazardous Materials Business Plan
Hp	horsepower
HPSR	Historic Property Survey Report
I-5	Interstate 5
IL4	Incremental Level 4 (water delivery)
IPCC	Intergovernmental Panel on Climate Change
L_{dn}	day-night average noise level
L_{eq}	energy-equivalent noise level
LF	Linear Feet
L_{max}	maximum noise level
LOS	Level of Service
LRA	Locally Responsible Area
LUST	leaking underground storage tank

MBR	Membrane bioreactor
MBTA	Migratory Bird Treaty Act
MEI	Maximally Exposed Individual
mg	Milligrams
MG	million gallons
mg/L	milligrams per liter
mgd	million gallons per day
MOU	Memorandum of Understanding
MPO	Metropolitan Planning Organization
MSDS	Material Safety Data Sheet
MTBM	Microtunneling boring machine
MVFPD	Mountain View Fire Protection District
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Comission
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NHTSA	National Highway Traffic Safety Administration
NMFS	National Marine Fisheries Service
NO_2	nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NOP	Notice of Preparation
NO_x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRCS	National Natural Resources Conservation Service
NVRRWP	North Valley Regional Recycled Water Program
NWR	National Wildlife Refuge
O_3	Ozone
OBD	On-board diagnostic system
OFWD	Oak Flat Water District
OPR	Office of Planning and Research
OSHA	Occupational Safety and Health Administration
Pb	Lead

PFCs	Perflourocarbons
PG&E	Pacific Gas & Electric
PID	Patterson Irrigation District
PM_{10}	Particulate Matter $\leq$ 10 microns
$PM_{2.5}$	Particulate Matter $\leq$ 2.5 microns
PPCP	Pharmaceutical and Personal Care Products
ppm	parts per million
PPV	Peak particle velocity
PVC	Polyvinyl chloride
RCRA	Resource Conservation and Recovery Act
ROG	Reactive organic gases
ROW	right-of-way
RPF	Renewables Portfolio Standard
RSL	Regional Screening Levels
RWQCB	Regional Water Quality Control Board
RWQCF	(Turlock) Regional Water Quality Control Facility
SAA	Streambed Alteration Agreement
SARA	Superfund Amendments and Reauthorization Act
SB	Senate Bill
SCVWD	Santa Clara Valley Water District
SDC	Seismic Design Category
SDWA	Federal Safe Drinking Water Act
SF_6	Sulfur hexafluoride
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan (SIP)
SJCOG	San Joaquin Council of Governments
SJV	San Joaquin Valley
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SLDMWA	San Luis and Delta-Mendota Water Authority
SLIC	Spills, Leaks, Investigations, and Clean-up
SO_2	sulfur dioxide
SO_x	sulfur oxides
SOD	South of Delta

SP&T	San Pablo and Tulare Extension Railroad Company
SR	State Route
SRA	State Responsibility Area
SRA	State Recreation Area
SSC	Species of Special Concern
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	toxic air contaminant
TDS	total dissolved solids
TID	Turlock Irrigation District
TMDL	Total Maximum Daily Load
TMP	Traffic Management Plan
U.S.C.	United States Code
UBC	Uniform Building Code
UCR	Uniform Crime Reporting Program
URBEMIS model	Urban Emissions (URBEMIS) model
USACE	US Army Corps of Engineers
USBR	United States Bureau of Reclamation
USFWS	US Fish and Wildlife Service
USGS	US Geological Survey
UV	Ultraviolet light
VdB	Vibration velocity in decibels
VERA	Voluntary Emissions Reduction Agreement
VOC	Volatile organic compounds
WA	(State) Wildlife Area
WDR	Waste Discharge Requirements
WFPD	Westport Fire Protection District
WQCF	(Modesto) Water Quality Control Facility
WSCFPD	West Stanislaus County Fire Protection District
WSID	West Stanislaus Irrigation District

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Executive Summary

ES-1 Introduction

The U.S. Department of Interior, Bureau of Reclamation (Reclamation) and City of Modesto as lead agency for the Partner Agencies for the North Valley Regional Recycled Water Program (NVRRWP) have prepared this Draft Environmental Impact Report/Environmental Impact Statement (Draft EIR/EIS). The Partner Agencies for the NVRRWP include the Cities of Modesto and Turlock and the Del Puerto Water District (DPWD). The NVRRWP has been developed in conformance with the requirements of Reclamation Directives and Standards for the Title XVI Reclamation and Reuse Program (USBR Document WTR 11-01), including preparation of a Feasibility Study, which identified and evaluated feasible conveyance alternatives that are included in this EIR/EIS.

This EIR/EIS has been developed to provide the public and responsible and trustee agencies reviewing the NVRRWP an analysis of the potential effects on the local and regional environment associated with construction and operation of the NVRRWP. The primary purpose of the NVRRWP is to provide recycled water from the Cities of Modesto and Turlock to the DPWD to address water supply shortages within DPWD's service area on the west side of the San Joaquin River in San Joaquin, Stanislaus and Merced Counties, south of the Sacramento-San Joaquin River Delta (Delta) (see **Figure ES-** 1). The NVRRWP would also provide water to south of Delta (SOD) Central Valley Project Improvement Act (CVPIA)-Designated Refuges. The proposed project would convey recycled water from the Cities of Modesto and Turlock to the Delta-Mendota-Canal (DMC). From the DMC, water would be provided to DPWD and to Refuges through existing turnouts from the DMC.

This EIR/EIS considers a No Project/No Action alternative and three Action Alternatives. The Action Alternatives include two pipeline alignment alternatives for conveying recycled water to the DMC from the Cities of Modesto and Turlock. The pipeline alternatives would convey recycled water through pipelines that extend from each city's existing discharge location to the DMC. Under these alternatives discharges to the river would be discontinued.

In addition to the pipeline alternatives, a third alternative has been developed with the aim of reducing the amount of construction needed to develop a conveyance system. This alternative continues discharge and would use the San Joaquin River and expanded Patterson Irrigation District (PID) facilities for conveyance. The alternatives considered are:

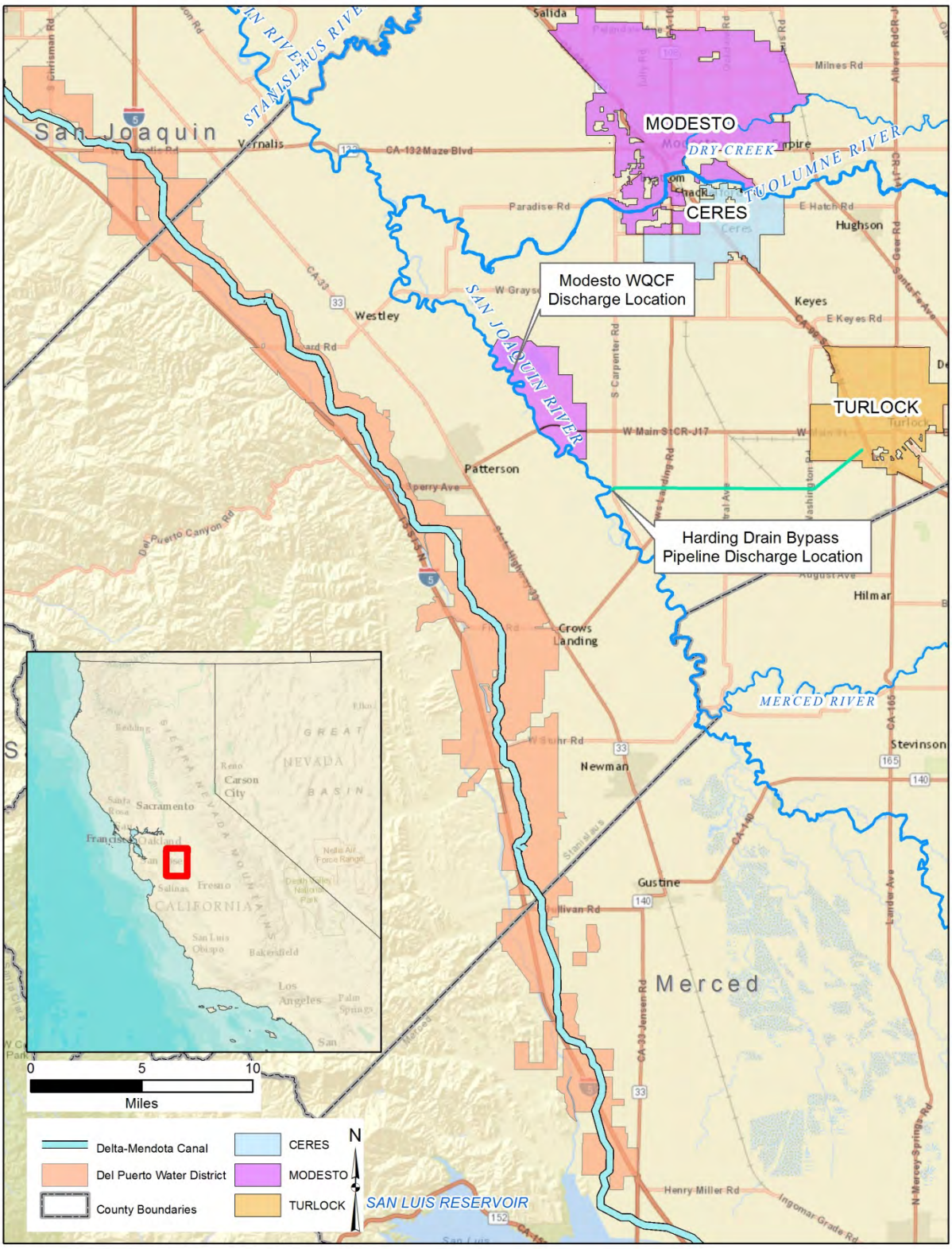
No Project/No Action Alternative, assumes that the proposed project would not be constructed and that recycled water would not be supplied to DPWD or to south of Delta Refuges.

Alternative 1, Combined Alignment Alternative, would convey recycled water from the City of Turlock through a pipeline beginning at the end of the existing Harding Drain Bypass Pipeline north to the City of Modesto's Jennings Water Quality Control Facility (WQCF or Jennings Plant), where it would be combined with recycled water from Modesto. From the Jennings Plant the pipeline would cross under the San Joaquin River, and convey water to the DMC.

Alternative 2, Separate Alignment Alternative, would include two separate pipelines to convey flows from Turlock and Modesto: one from the end of the Harding Drain Bypass Pipeline, crossing under the San Joaquin River and conveying flows to the DMC, and one from Modesto's Jennings Plant, crossing under the river and delivering water to the DMC.

Alternative 3. PID Conveyance Alternative, would continue the existing Modesto and Turlock discharges to the San Joaquin River, which would function as a part of the conveyance system. Water would be diverted from the river through the PID intake and conveyed to the DMC through expanded PID facilities. Because the existing PID system does not have sufficient capacity to convey all of the recycled water flows from Modesto and Turlock, this alternative would need to include expansion of the existing

Figure ES- 1: Project Vicinity



PID intake structure on the San Joaquin River, and expansion of the conveyance system through construction of a new pipeline paralleling the PID Main Canal.

ES-2 Background

Del Puerto Water District (DPWD or District) is located along the west side of the San Joaquin Valley adjacent to the Delta-Mendota Canal, and extends from near Vernalis in the north to near Santa Nella in the south. The District provides agricultural irrigation water to approximately 45,000 acres of productive farmland in Stanislaus, San Joaquin, and Merced Counties. Currently, DPWD's only source of water is through a contract with the United States Bureau of Reclamation (Reclamation or USBR) for the delivery of up to 140,210 acre-feet (AF) of Central Valley Project (CVP) water annually.

Since the early 1990s, DPWD's CVP water allocations have been significantly reduced due to Delta pumping restrictions resulting from the passage of the Central Valley Project Improvement Act (CVPIA), water rights decisions that were implemented to address Delta water quality objectives, National Marine Fisheries Service (NMFS) salmon and United States Fish and Wildlife Service (USFWS) Delta smelt biological opinions, and drought conditions. In 2014, DPWD received a 0 percent allocation of its CVP contract. Future contract water deliveries to DPWD are uncertain, so DPWD is seeking a reliable alternative water supply.

DPWD's service area is located a little over five miles from Modesto's Water Quality Control Facility (WQCF) and less than five miles from the end of Turlock's Harding Drain Bypass Pipeline, which will convey flows from the Turlock Regional Water Quality Control Facility (RWQCF) to a discharge located on the San Joaquin River. Both Modesto and Turlock have recycled water available that could be delivered to the District and its customers. This supply of recycled water from Modesto and Turlock could provide a long-term, reliable water supply for the DPWD and its customers that would serve to augment DPWD's CVP supply.

In addition to provision of water to the DPWD service area, the proposed project would make recycled water available to the south of the Delta CVPIA-designated Refuges to meet CVPIA requirements. Reclamation has a legislative obligation under the CVPIA, in cooperation with the U.S. Fish and Wildlife Service (USFWS) and the California Department of Fish and Wildlife (CDFW) to provide firm, average annual historical water deliveries (Level 2, or L2) of suitable quality to maintain and improve habitat areas on certain federal and state wildlife Refuges in the Central Valley. In addition to L2 deliveries, an additional increment of water supply is needed for optimal wildlife management (incremental Level 4, or IL4). Provision of secure firm, reliable water supplies for the Refuges to meet the CVPIA-mandated water levels has not been achieved "due in large part to state and federal budget shortages, inconsistency in the timing of water deliveries, and increases in the costs of blocks of water made available annually from willing sellers on the open market" (CVJV 2006).

ES-3 Purpose and Need

One of the authorized purposes of the CVP is to provide water for irrigation and domestic use within California's Central Valley. In recent years, SOD CVP contractors and CVPIA-designated wildlife refuges have experienced an increased reduction in CVP water allocations from historical amounts due to drought conditions and expanded Delta pumping restrictions. As a CVP contractor, DPWD has a need to establish alternative, reliable long-term agricultural water supplies to offset this reduction in supply. Also CVPIA Section 3406(d)(2) directs Reclamation to acquire and provide supplemental water to all CVPIA designated wildlife refuges in the Central Valley. The purpose of the project is to make the Cities' recycled water available to DPWD for agricultural purposes, to provide an additional source of water south of the Delta, which can be used to meet both agricultural and support SOD refuge wildlife.

ES-4 CEQA Objectives

The overall objective of the proposed project is to maximize beneficial use of a sustainable, alternative water supply within the region, which would address reductions in water supplies from the CVP and reduce the reliance on groundwater use. Specifically, the objectives of the project are as follows:

- Establish an alternative, reliable, long-term water supply of up to 59,000 acre feet per year (AFY) of recycled water for DPWD and refuges;
- Maximize beneficial use of recycled water by DPWD customers and refuges;
- Maximize Project Partners' control of operations and delivery of water to DPWD and refuges, while recognizing the need for coordination with Reclamation and the San Luis & Delta-Mendota Water Authority;
- Establish a long-term water right(s) to allow for the beneficial use of recycled water;
- Maximize use of existing facilities for treatment / delivery of recycled water;
- Provide supplemental annual water supplies annually to SOD refuges to meet CVPIA Sections 3406(b)(3) and 3406(d)(2) requirements;
- Avoid or minimize, through incorporation of design constraints and management practices, impacts to environmental resources such as surface water, groundwater supplies, land subsidence, groundwater quality and biological resources including sensitive species; and
- Deliver agricultural water to DPWD at a cost that supports regional economic sustainability.

The proposed project is needed to offset the significant reduction in CVP water allocations to DPWD associated with Delta pumping restrictions, drought conditions, and climate change. In addition, the proposed project is needed to offset anticipated effects (e.g., overdraft, subsidence, water quality issues) from increased groundwater pumping that have occurred and would likely continue to occur with the absence of an alternative water supply.

ES-5 Feasibility Study

The NVRRWP Project Partners have worked cooperatively to define shared objectives and develop feasible alternatives to provide a supply of recycled water to DPWD. Their efforts culminated in the preparation of a Feasibility Study for the NVRRWP, which was completed in December 2013 (RMC 2013). The Feasibility Study documents the process for development of alternatives, and includes and economic and financial analysis.

ES-6 Summary of Impacts

Table ES-1 provides a summary of potential impacts by topic area for CEQA compliance. The table does not include impacts or criteria that were deemed not applicable to construction or operation of the NVRRWP. The proposed project would not result in any significant and unavoidable impacts for either alternative alignment. The No Action Alternative has the potential to result in significant and unavoidable impacts associated with conversion of agricultural land to non agriculture land uses resulting from a lack of reliable water supply.

Table ES-1: NVRRWP EIR/EIS Impact

Impact Statement	Level of Significance Before Mitigation				Mitigation Measure	Level of Significance After Mitigation			
	1-Combined Alignment	2-Separate Alignments	3 – PID Conveyance	No Project/ Action		1-Combined Alignment	2-Separate Alignments	3 – PID Conveyance	No Project/ Action
Aesthetics									
AES-1: Substantial damage to scenic resources and substantial degradation of existing visual character	LTS	LTS	LTS	LTS	No mitigation necessary	LTS	LTS	LTS	LTS
AES-2: New sources of substantial light or glare	PS	PS	PS	NI	AES-1: Nighttime Construction Lighting (Alternatives 1, 2, 3) AES-2: Directional Security Lighting for New Pump Station at Harding Drain Bypass Pipeline (Alternative 2)	LSM	LSM	LSM	NI
Agriculture and Forestry Resources									
AG-1: Convert farmland to non-agricultural use	PS	PS	PS	S&U	AG-1: Stockpile Soil (Alternatives 1, 2, 3)	LSM	LSM	LSM	S&U
AG-2: Conflict with existing zoning for agricultural use	B	LTS	B	NI	No mitigation necessary	B	LTS	B	NI
AG-3: Conflict with Williamson Act contract	NI	LTS	NI	S&U	No mitigation necessary	NI	LTS	NI	S&U
AG-4: Provide drought-resistant source of water to agriculture	B	B	B	S&U	No mitigation necessary	B	B	B	S&U
Air Quality									
AIR-1: Construction emissions of criteria pollutants and precursors	PS	PS	PS	NI	AIR-1: Reduce NOx Emissions (Alternatives 1, 2, 3)	LSM	LSM	LSM	NI
AIR-2: Local community risks and hazards during construction	LTS	LTS	LTS	NI	No mitigation necessary	LTS	LTS	LTS	NI
AIR-3: Odors generated during project construction	LTS	LTS	LTS	NI	No mitigation necessary	LTS	LTS	LTS	NI
AIR-4: Direct emissions of criteria pollutants during project operation	LTS	LTS	LTS	LTS	No mitigation necessary	LTS	LTS	LTS	LTS
AIR-5: Local community risks and hazards during project operation	LTS	LTS	LTS	LTS	No mitigation necessary	LTS	LTS	LTS	LTS
AIR-6: Odor emissions during project operation	LTS	LTS	LTS	LTS	No mitigation necessary	LTS	LTS	LTS	LTS
AIR-7: Consistency with applicable air quality plans	LTS	LTS	LTS	LTS	No mitigation necessary	LTS	LTS	LTS	LTS
Biological Resources									
BIO-1: Effects on special-status plants	PS	PS	PS	NI	BIO-1a: Avoid or Minimize Impacts to Special-Status Plant Species (Alternatives 1, 2, 3) BIO-1b: Perform Focused Surveys for Special-Status Plant Species in Suitable Habitats (Alternatives 1, 2, 3) BIO-1c: Monitor or Compensate for Impacts to Special-Status Plant Species (Alternatives 1, 2, 3) BIO-1d: Develop and Implement a Frac-out Contingency Plan for Trenchless Construction (Alternatives 1 and 2)	LSM	LSM	LSM	NI
BIO-2: Effects on vernal pool fairy branchiopods	PS	NI	NI	NI	BIO-2a: Avoid Impacts to Vernal Pool Branchiopods and their Habitat (Alternative 1) BIO-2b: Minimize and Compensate for Impacts to Vernal Pool Fairy Shrimp and Their Habitat (Alternative 1)	LSM	NI	NI	NI

Notes: NI= No Impact, LTS=Less than Significant, PS=Potentially Significant, LSM=Less than Significant with Mitigation, S&U=Significant and Unavoidable, B=Beneficial; Alternative 1=Combined Alignment, Alternative 2=Separate Alignment, Alternative 3=PID Conveyance

Impact Statement	Level of Significance Before Mitigation				Mitigation Measure	Level of Significance After Mitigation			
	1-Combined Alignment	2-Separate Alignments	3 – PID Conveyance	No Project/ Action		1-Combined Alignment	2-Separate Alignments	3 – PID Conveyance	No Project/ Action
BIO-3: Effects on valley elderberry longhorn beetle	PS	PS	PS	NI	BIO-1d: Develop and Implement a Frac-out Contingency Plan for Trenchless Construction (Alternatives 1 and 2) BIO-3a: Avoid Impacts to Valley Elderberry Longhorn Beetle (Alternatives 1, 2, 3) BIO-3b: Minimize or Compensate for Impacts to Valley Elderberry Longhorn Beetle (Alternatives 1, 2, 3)	LSM	LSM	LSM	NI
BIO-4: Effects of project construction on special-status fishes	PS	PS	PS	NI	BIO-1d: Develop and Implement a Frac-out Contingency Plan for Trenchless Construction (Alternatives 1 and 2) BIO-4a: Minimize Pile Driving-related Impacts to Special Status Fish (Alternatives 1 and 2) BIO-4b: Best Management Practices for In-River Intake Construction (Alternative 3)	LSM	LSM	LSM	NI
BIO-5: Effects of project operations on special-status fishes	LTS	LTS	LTS	NI	No mitigation necessary	LTS	LTS	LTS	NI
BIO-6: Effects on giant garter snake	PS	PS	PS	NI	BIO-6: Avoid and Minimize Impacts to Giant Garter Snake (Alternatives 1, 2, 3)	LSM	LSM	LSM	NI
BIO-7: Effects on San Joaquin whipsnake	LTS	LTS	LTS	NI	No mitigation necessary	LTS	LTS	LTS	NI
BIO-8: Effects on western pond turtle	PS	PS	PS	NI	BIO-8: Avoid and Minimize Impacts to Western Pond Turtle (Alternatives 1, 2, 3)	LSM	LSM	LSM	NI
BIO-9: Effects on burrowing owl	PS	PS	PS	NI	BIO-9: Avoid, Minimize, or Compensate for Impacts to Burrowing Owl (Alternatives 1, 2, 3)	LSM	LSM	LSM	NI
BIO-10: Effects on tricolored blackbird	PS	PS	PS	NI	BIO-10: Avoid and Minimize Impacts to Tricolored Blackbird Nesting Colonies (Alternatives 1, 2, 3)	LSM	LSM	LSM	NI
BIO-11: Effects on golden eagle and bald eagle	LTS	LTS	LTS	NI	No mitigation necessary	LTS	LTS	LTS	NI
BIO-12: Effects on raptors including special-status species	PS	PS	PS	NI	BIO-12: Avoid, Minimize, or Compensate for Impacts to Raptors including Special-status species (Alternatives 1, 2, 3)	LSM	LSM	LSM	NI
BIO-13: Effects on special-status passerine species and birds protected under the MBTA	PS	PS	PS	NI	BIO-13: Avoid and Minimize Impacts to Special-status passerine species and other Birds Protected under the MBTA (Alternatives 1, 2, 3)	LSM	LSM	LSM	NI
BIO-14: Effects on special-status mammals	PS	PS	PS	NI	BIO-14a: Avoid and Minimize Impacts to San Joaquin kit fox (Alternatives 1, 2, 3) BIO-14b: Avoid and Minimize Impacts to Special-Status Bats (Altrnative 3)	LSM	LSM	LSM	NI
BIO-15: Effects on riparian habitat and other sensitive natural communities	PS	PS	PS	NI	BIO-1d: Develop and Implement a Frac-out Contingency Plan for Trenchless Construction (Alternatives 1 and 2) BIO-2a: Avoid Impacts to Vernal Pool Branchiopods and Their Habitat (Alternative 1) BIO-16a: Avoid and Minimize Impacts to Federally Protected Wetlands (Alternatives 1, 2, 3) BIO-16b: Obtain Regulatory Permits for Work Activities Taking Place in Wetlands and Waters of the United States and the State (Alternatives 1, 2, 3)	LSM	LSM	LSM	NI

Notes: NI= No Impact, LTS=Less than Significant, PS=Potentially Significant, LSM=Less than Significant with Mitigation, S&U=Significant and Unavoidable, B=Beneficial; Alternative 1=Combined Alignment, Alternative 2=Separate Alignment, Alternative 3=PID Conveyance

Impact Statement	Level of Significance Before Mitigation				Mitigation Measure	Level of Significance After Mitigation			
	1-Combined Alignment	2-Separate Alignments	3 – PID Conveyance	No Project/ Action		1-Combined Alignment	2-Separate Alignments	3 – PID Conveyance	No Project/ Action
BIO-16: Effects on federally protected wetlands	PS	PS	PS	NI	BIO-1d: Develop and Implement a Frac-out Contingency Plan for Trenchless Construction (Alternatives 1 and 2) BIO-16a: Avoid and Minimize Impacts to Federally Protected Wetlands (Alternatives 1, 2, 3) BIO-16b: Obtain Regulatory Permits for Work Activities Taking Place in Wetlands and Waters of the United States and the State (Alternatives 1, 2, 3)	LSM	LSM	LSM	NI
BIO-17: Effects on movement of fish and wildlife and use of breeding sites	PS	PS	PS	NI	See Mitigation Measures BIO-6, 8, 9, 10, 12 and 13 (Alternatives 1, 2, 3) and Mitigation Measure BIO-4 (Alternative 3) TR-2: Install Temporary Trench Plates Over Open Trenches (Alternatives 1, 2, 3)	LSM	LSM	LSM	NI
BIO-18: Conflict with local ordinances or policies protecting biological resources	PS	PS	PS	NI	See Mitigation Measures BIO-1d (Alternatives 1 and 2), 2a (Alternative 1), BIO-4b (Alternative 3) and 16a (Alternatives 1, 2, 3)	LSM	LSM	LSM	NI
BIO-19: Effects on existing Habitat Conservation Plan (HCP)	LTS	LTS	LTS	NI	No mitigation necessary	LTS	LTS	LTS	NI
BIO-CUM-2: Effects on fish species and their habitats	PS	PS	PS	PS	BIOCUM-1: Assistance with Salmonid Recovery Plan Actions (Alternatives 1, 2, 3)	LSM	LSM	LSM	PS
Cultural Resources									
CUL-1: Substantial adverse change in the significance of a unique archaeological resource or disturb any human remains, including those interred outside of formal cemeteries.	PS	PS	PS	NI	CUL-1: Discovery of previously unknown archaeological resources during construction (Alternatives 1, 2, 3) CUL-2: Discovery of human burials during construction (Alternatives 1, 2, 3)	LSM	LSM	LSM	NI
CUL-2: Cause a substantial adverse change in the significance of a historical resource	PS	PS	PS	NI	CUL-1: Discovery of previously unknown archaeological resources during construction (Alternatives 1, 2, 3)	LSM	LSM	LSM	NI
CUL-3: Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature	PS	PS	PS	NI	CUL-3: Discovery of paleontological resources during construction (Alternatives 1, 2, 3)	LSM	LSM	LSM	NI
Energy									
ENE-1: Inefficient, wasteful, or unnecessary use of energy resources	PS	PS	PS	LTS	AIR-1: Reduce NOx Emissions (Alternatives 1, 2, 3)	LSM	LSM	LSM	LTS
Geology, Soils, and Seismicity									
GEO-1: Facility damage and exposure of people to hazards from strong seismic groundshaking	PS	PS	PS	NI	GEO-1: Perform Design-Level Geotechnical Evaluations for Seismic Hazards (Alternatives 1, 2, 3)	LSM	LSM	LSM	NI
GEO-2: Facility damage and exposure of people to hazards from liquefaction and lateral spreading	PS	PS	PS	NI	GEO-2: Perform Design-Level Geotechnical Evaluations for Soil Expansion (Alternatives 1, 2, 3)	LSM	LSM	LSM	NI
GEO-3: Potential for substantial erosion or loss of top soil	LTS	LTS	LTS	NI	No mitigation necessary	LTS	LTS	LTS	NI
Greenhouse Gas Emissions									
GHG-1: GHG construction emissions	LTS	LTS	LTS	NI	No mitigation necessary	LTS	LTS	LTS	NI
GHG-2: GHG operational emissions	LTS	LTS	LTS	LTS	No mitigation necessary	LTS	LTS	LTS	LTS
GHG-3: Consistency with applicable GHG reduction plans	LTS	LTS	LTS	LTS	No mitigation necessary	LTS	LTS	LTS	LTS

Notes: NI= No Impact, LTS=Less than Significant, PS=Potentially Significant, LSM=Less than Significant with Mitigation, S&U=Significant and Unavoidable, B=Beneficial; Alternative 1=Combined Alignment, Alternative 2=Separate Alignment, Alternative 3=PID Conveyance

Impact Statement	Level of Significance Before Mitigation				Mitigation Measure	Level of Significance After Mitigation			
	1-Combined Alignment	2-Separate Alignments	3 – PID Conveyance	No Project/ Action		1-Combined Alignment	2-Separate Alignments	3 – PID Conveyance	No Project/ Action
Hazards and Hazardous Materials									
HAZ-1: Create a Hazard through Reasonably Foreseeable Upset and Accident Conditions Involving Release of Hazardous Materials into the Environment	PS	PS	PS	NI	HAZ-1a: Hazardous Materials Management and Spill Prevention Control Plan (Alternatives 1, 2, 3) HAZ-1b: Conduct Phase I Study along Pipeline Segments (Alternatives 2 and 3)	LSM	LSM	LTS	NI
HAZ-2: Expose People or Structures to a Significant Risk of Loss, Injury or Death Involving Wildland Fires	LTS	LTS	LTS	NI	HAZ-2: Prevention of Fire Hazards (Alternatives 1, 2, 3)	LTS	LTS	LTS	NI
HAZ-3: Conflict with Any Adopted Emergency Response Plan or Emergency Evacuation Plan	PS	PS	PS	NI	See Mitigation Measures HAZ-1a, HAZ-1b, and HAZ-2	LSM	LSM	LTS	NI
Hydrology and Water Quality									
HYD-1: Violation of Water Quality Standards and/or Waste Discharge Requirements (Due to Construction Activities)	PS	PS	PS	NI	HYD-1a: Comply with the Construction General Permit (Alternatives 1, 2, 3) HYD-1b: Implement BMPs to Control Erosion and Sediment During Construction (Alternatives 1, 2, 3) HYD-1c: Comply with the General Order for Dewatering or Other Appropriate NPDES Permit (Alternatives 1, 2, 3) BIO-1d: Develop and Implement a Frac-out Contingency Plan for Trenchless Construction (Alternatives 1 and 2)	LSM	LSM	LSM	NI
HYD-2: Violation of Water Quality Standards and/or Waste Discharge Requirements (at Project Implementation)	LTS	LTS	LTS	LTS	No mitigation necessary	LTS	LTS	LTS	LTS
HYD-3: Substantial Depletion of Groundwater Supplies or Substantial Interference with Groundwater Recharge	LTS	LTS	LTS	PS	No mitigation necessary	LTS	LTS	LTS	PS
HYD-4: Otherwise substantially degrade water quality (Constituents of Emerging Concern)	LTS	LTS	LTS	LTS	No mitigation necessary	LTS	LTS	LTS	LTS
HYD-5: Reduction of Flows in San Joaquin River	LTS	LTS	LTS	LTS	No mitigation necessary	LTS	LTS	LTS	LTS
HYD-6: Effect on Delta Exports at Banks and Tracy Pumping Plants	LTS	LTS	LTS	LTS	No mitigation necessary	LTS	LTS	LTS	LTS
Land Use and Planning									
LU-1: Physically divide an established community or result in land use conflicts	NI	NI	NI	NI	No mitigation necessary	NI	NI	NI	LTS
LU-2: Conflict with any applicable land use plan, policy or regulation	LTS	LTS	LTS	S&U	No mitigation necessary for action alternatives/ No mitigation possible for No Project/No Action	LTS	LTS	LTS	S&U
Noise									
NOI-1: Temporary Construction-Related Noise Increases	PS	PS	PS	NI	NOISE-1: Noise Reduction Measures (Alternatives 1, 2,3)	LTS	LTS	LTS	NI
NOI-2: Temporary disturbance from construction-related vibration increases	LTS	LTS	LTS	NI	No mitigation necessary	LTS	LTS	LTS	NI
NOI-3: Increases in ambient noise levels due to operational noise and vibration	LTS	LTS	LTS	LTS	No mitigation necessary	LTS	LTS	LTS	LTS

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Public Services and Utilities									
PUB-1: Impacts associated with new or altered governmental facilities to maintain acceptable levels of performance	LTS	LTS	LTS	NI	No mitigation necessary	LTS	LTS	LTS	NI
PUB-2: Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board.	LTS	LTS	PS	LTS	No mitigation necessary (Alternatives 1 and 2) PUB-2: Treatment Plant Upgrades (Alternative 3)	LTS	LTS	LSM	LTS
PUB-3: Served by a landfill without sufficient permitted capacity or violate regulations related to solid waste	LTS	LTS	LTS	NI	No mitigation necessary	LTS	LTS	LTS	NI
PUB-4: Temporary disruption of utilities or services due to construction-related activities	PS	PS	PS	NI	PUB-4: Coordinate Relocation and Interruptions of Service with Utility Providers during Construction (Alternatives 1, 2, 3)	LSM	LSM	LSM	NI
PUB-5: Could require construction of new wastewater treatment facilities that would cause significant environmental effects	NI	NI	S&U	S&U	No mitigation defined for PID Conveyance Alternative	NI	NI	S&U	S&U
Recreation									
REC-1: Substantial impairment of the use of existing parks or other recreational facilities	LTS	LTS	LTS	NI	No mitigation necessary	LTS	LTS	LTS	NI
REC-2: Increase in water flow to the National Wildlife refuges such that substantial increase in birdwatching and other recreational opportunities would occur	NI	NI	NI	NI	No mitigation necessary	NI	NI	NI	NI
Transportation									
TR-1: Temporary Lane and Road Closures and Potential for LOS Degradation	PS	PS	PS	NI	TR-1: Implement a Construction Management Plan to Minimize Interference with Traffic and Emergency Response Hazards (Alternatives 1, 2, 3)	LTS	LTS	LTS	NI
TR-2: Potential Impacts on Public Transit, Bicycle, and Pedestrian Uses of Affected Roadways	PS	PS	PS	NI	TR-1: Implement a Construction Management Plan to Minimize Interference with Traffic and Emergency Response Hazards (Alternatives 1, 2, 3)	LTS	LTS	LTS	NI
TR-3: Interference with Emergency Access and Circulation	PS	PS	PS	NI	TR-1: Implement a Construction Management Plan to Minimize Interference with Traffic and Emergency Response Hazards (Alternatives 1, 2, 3)	LTS	LTS	LTS	NI
TR-4: Impacts to Traffic and Circulation from Trip Generation	PS	PS	PS	NI	TR-1: Implement a Construction Management Plan to Minimize Interference with Traffic and Emergency Response Hazards (Alternatives 1, 2, 3)	LTS	LTS	LTS	NI
TR-5: Damage to Driveways from Open Trench Excavation	PS	PS	PS	NI	TR-1: Implement a Construction Management Plan to Minimize Interference with Traffic and Emergency Response Hazards (Alternatives 1, 2, 3) TR-2: Install Temporary Trench Plates Over Open Trenches (Alternatives 1, 2, 3)	LTS	LTS	LTS	NI
TR-6: Impacts to State Route 33 and California Northern Railroad Company Railroad Tracks	NI	NI	NI	NI	No mitigation necessary	NI	NI	NI	NI
TR-7: Impacts to Roadway Surfaces as a Result of Construction Activities	LTS	LTS	LTS	NI	No mitigation necessary	LTS	LTS	LTS	NI

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Chapter 1 Introduction

The U.S. Department of Interior, Bureau of Reclamation (Reclamation) as NEPA lead agency and the City of Modesto, as CEQA lead agency representing the Partner Agencies for the North Valley Regional Recycled Water Program (NVRRWP), have prepared this Draft Environmental Impact Report/Environmental Impact Statement (Draft EIR/EIS). The Partner Agencies for the NVRRWP include the Cities of Modesto and Turlock and the Del Puerto Water District (DPWD). The NVRRWP has been developed in conformance with the requirements of Reclamation's Directives and Standards for the Title XVI Reclamation and Reuse Program (Reclamation Document WTR 11-01), including preparation of a Feasibility Study, which identified and evaluated feasible conveyance alternatives that are included in this EIR/EIS.

This EIR/EIS has been developed to provide the public and responsible and trustee agencies reviewing the NVRRWP an analysis of the potential effects on the local and regional environment associated with construction and operation of the NVRRWP. The primary purpose of the NVRRWP is to provide recycled water from the Cities of Modesto and Turlock to DPWD to address water supply shortages within DPWD's service area south of the Sacramento-San Joaquin River Delta (Delta) on the west side of the San Joaquin River in San Joaquin, Stanislaus and Merced Counties. **Figure 1-1** shows the project vicinity. The NVRRWP would also provide supplemental water to certain south of Delta (SOD) Central Valley Project Improvement Act (CVPIA)-designated wildlife refuges and wetland areas.

1.1 Background

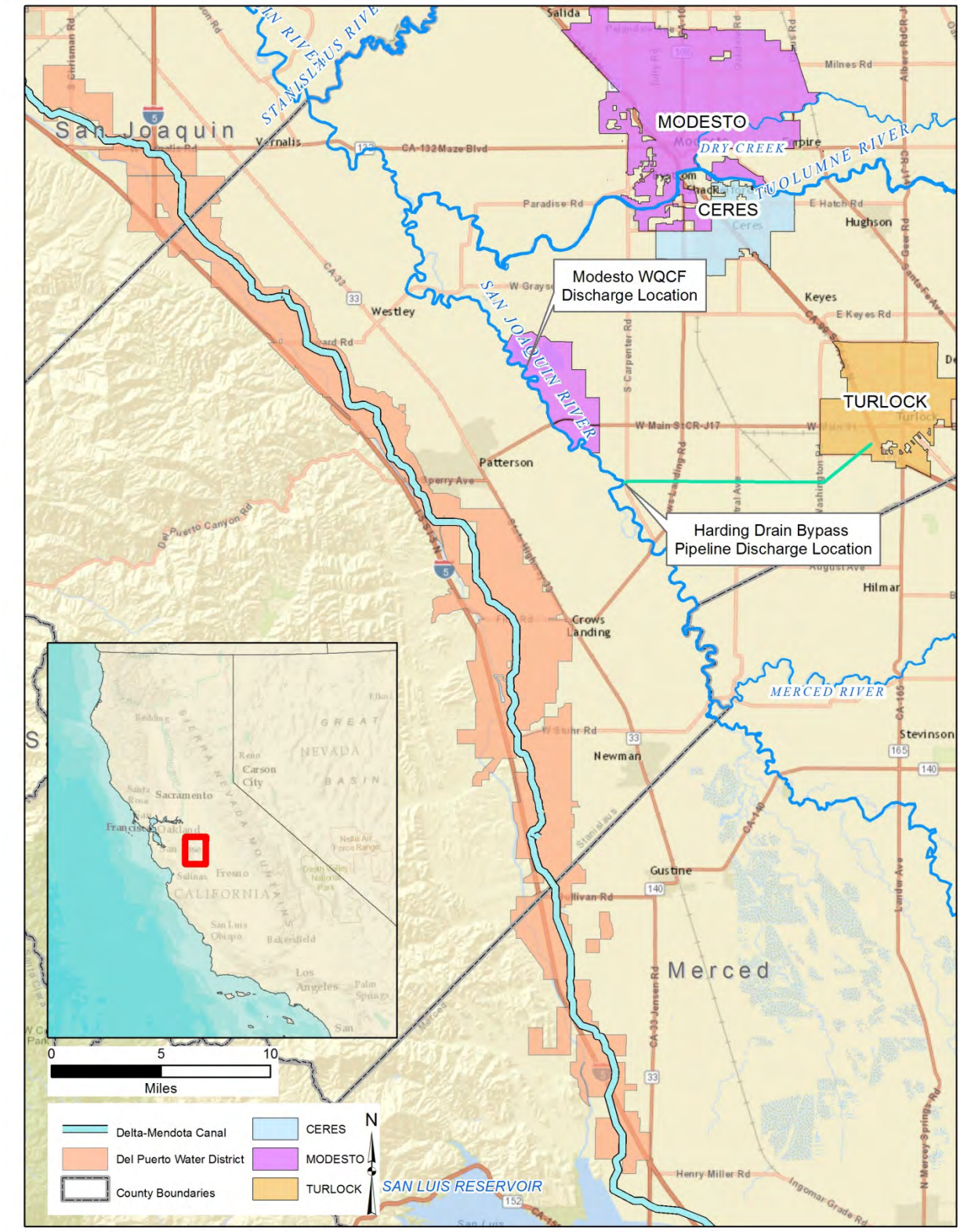
1.1.1 DPWD's Need for an Alternative Water Supply

DPWD provides irrigation water to approximately 45,000 acres of productive farmland in western San Joaquin, Stanislaus, and Merced Counties. Currently, DPWD's primary source of water is from a contract with the United States which provides for the delivery of up to 140,210 acre-feet (AF) of Central Valley Project (CVP) water annually. The CVP is a federal water management project consisting of multiple dams and reservoirs, conveyance facilities, and other related facilities created to provide water to California's Central Valley.

Since the early 1990s, DPWD's annual CVP water allocation has been significantly reduced due to multiple factors, including;

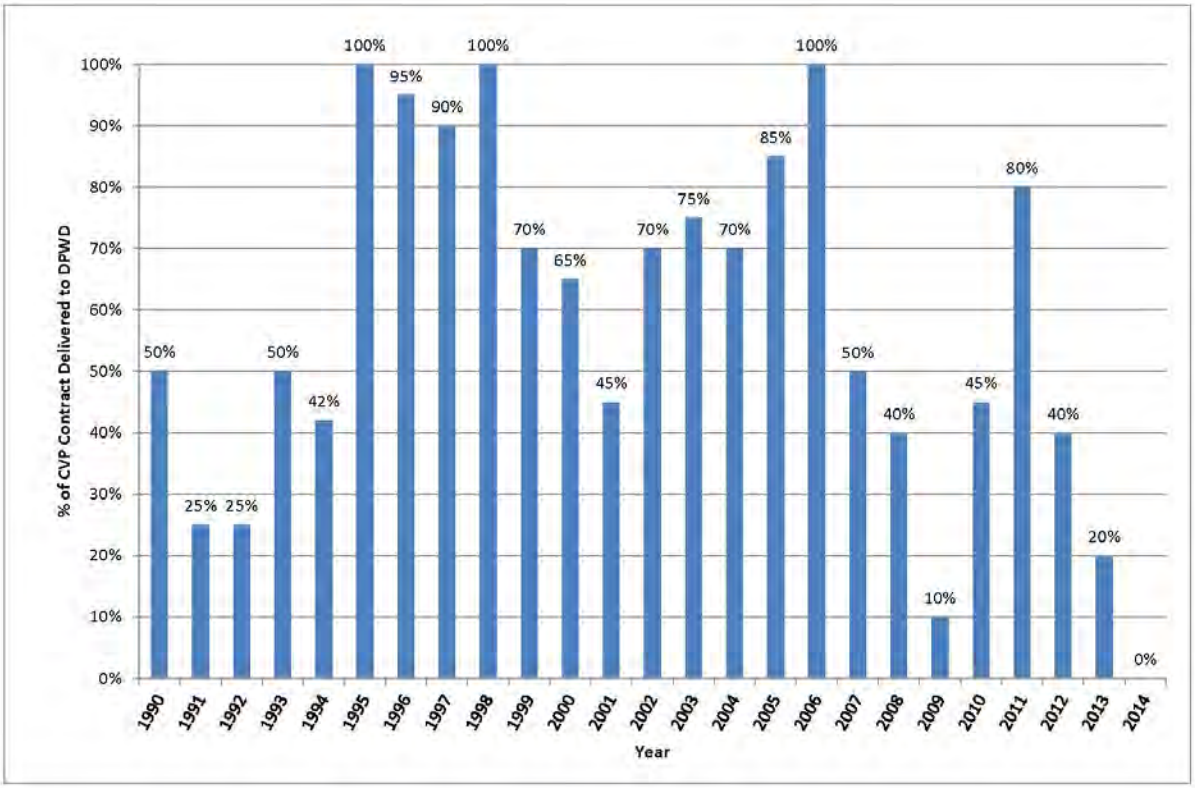
- Delta pumping restrictions resulting from the passage of the CVPIA and the CVPIA Anadromous Fish Restoration Program;
- Water rights decisions, in particular, Water Rights Decision 1485 regarding salinity control in the Sacramento-San Joaquin Delta and Suisun Marsh (SWRCB 1978), and the Bay Delta Accord, adopted as Water Right Decision 1641, which was implemented to address water quality objectives in the San Francisco Bay and Sacramento-San Joaquin Delta (SWRCB 2000);
- Water quality objectives as established in the Water Quality Control Plans for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary, most recently the 2006 Basin Plan (SWRCB 2006);
- National Marine Fisheries Service (NMFS) salmon and United States Fish and Wildlife Service (USFWS) Delta smelt biological opinions (USFWS 2008, NMFS 2009); and
- Drought conditions.

Figure 1-1: Project Vicinity



In 2009, DPWD received only 10 percent (i.e., 14,000 AFY) of its contract allocation. DPWD's contract supply for 2013 was 20 percent of their contracted allocation (28,000 AFY), and in 2014 the allocation is 0 percent. **Figure 1-2** shows the historic DPWD CVP allocations from 1990 to 2014 and the downward trend in the annual allocations (DPWD 2014). While future contract water deliveries to DPWD are uncertain, it is anticipated that restrictions on CVP operations will result in the District receiving no more than an average of 35 percent of its contract allocation (i.e., 49,000 AFY) on an annual basis under normal hydrologic conditions (i.e. non-drought conditions).

Figure 1-2: Historical CVP Allocations Delivered to DPWD



Source: DPWD 2014, Del Puerto Water District Historical Water Service Allocations and Rates

Shortages in CVP deliveries have resulted in economic hardships on the District and growers within the District's service area. To maintain the existing cropping patterns and economic conditions within the District, DPWD is compelled to secure alternate water supplies, and has done so through temporary water transfers from other agencies or the use of groundwater from privately owned wells. As another alternative, growers are forced to fallow land that would otherwise have been planted. From 2001 to 2014, from 12 to 24 percent of the agricultural land in the DPWD service area has been fallowed (DPWD 2013, 2014).

In 2014 DPWD received no allocation of CVP water, which has presented a severe hardship to growers in the District. Buying enough water through temporary transfers to keep crops growing is becoming more difficult every year, and sufficient groundwater is not available to supplement CVP supply. In 2014, preliminary reports indicate that the fallowed acreage has increased by almost 4,000 acres over the prior year's total of 7,239 acres to 11,020 acres of fallowed land. Fallowing is not an option for orchard crops, which need to be irrigated each and every year in a uniform pattern.

Water transfers have been partially effective in meeting the District's water demands in the past, but they are not a reliable or sustainable long-term solution because of uncertainty in the availability of surface water supplies in the future, the difficulties in the ability to wheel[1] water through the Delta, and the financial impact to customers associated with the high cost of supplemental surface water supplies. As the availability of water sources decreases, the cost of water transfers will increase while the ability to secure water for transfers will decrease. Several factors could impact the availability of surface water supplies in California. Climate change is expected to affect Delta water exports (Reclamation 2014) because weather patterns are anticipated to become more severe (longer droughts and wetter non-drought years) and warmer temperatures are expected to reduce snowpack amounts. These two climate-related changes are expected to impact the amount of surface water runoff, the timing of runoff, and the ability to store and use runoff. In addition, changes in climate are expected to result in rising sea levels, which will, in turn, increase the salinity of the Delta, requiring more fresh water to be kept in the Delta to maintain water quality conditions to support the Delta ecosystem and to maintain adequate flow and water quality. Additionally, because the time frame in which transfer water can be wheeled through the Delta is limited by the biological opinions to the months of July-September, a significant capital investment will be needed in the future to maintain the infrastructure system that enables Delta conveyance. Without these improvements, Delta conveyance will be limited, which ultimately impacts the ability of SOD water users to wheel water transfers through the Delta (California Water Plan Update 2009, Bulletin 160-09, DWR).

DPWD is located within the San Joaquin River groundwater basin and primarily overlies the Delta-Mendota groundwater subbasin, with a small section overlying the Tracy subbasin. The Delta-Mendota groundwater subbasin is not considered to be in a state of overdraft (DWR 2006), but there is concern that continued use of groundwater in DPWD's service area to supplement CVP water deliveries could result in potential issues such as declining water table elevation, land subsidence, degradation of groundwater quality, and adverse impacts to crop yield from unsuitable groundwater quality. Land subsidence creates problems both through direct effects (including ground failures and permanent reduction in the total storage capacity of the aquifer) and indirect effects (such as subsidence reducing freeboard and therefore reducing flow capacity in canals that convey water through the project area [Sneed et al. 2013]).

1.1.2 DPWD's Water Demands and Anticipated Shortfalls

Irrigation water demands were estimated for the entire District and each target delivery area based on the projected productive cropping acreages and the specific water demand for each crop grown in the District. The 2013 water demand was estimated at approximately 90,000 AFY (see **Figure 1-3**) and was assumed to represent the District's existing average annual water demand. The existing water demand represents the demand in a dry hydrologic year, when fallowing patterns may be higher than average. It is expected that if the District had an alternate, reliable source of water, cropping and fallowing patterns would revert to more historic patterns, where the projected water demand would be closer to 110,000 AFY. Projected monthly water demands are shown in **Figure 1-4**, and would vary depending on the season, from a very small amount in the winter (January) to a high of more than 25,000 AF in the middle of summer.

It is predicted that future deliveries from the CVP to DPWD will average approximately 49,000 AFY[2], an allocation of only 1 AF/acre (RMC 2013), which is inadequate to meet the District's water demand. This would result in an anticipated average shortfall of 41,000 AFY (see **Figure 1-3**). If compared to the 2013

[1] Wheeling is the conveyance of water by an entity that does not own the water it is conveying.

[2] Under current regulatory conditions, it is estimated that in the future, DPWD may receive no more than 35 percent of their contract entitlement (49,000 AFY) in an average hydrologic year, which would provide only 1 AF/acre. The future deliveries to DPWD were developed by applying historic South of Delta allocation reductions from Delta pumping restrictions due to hydrologic conditions and regulatory requirements to the DPWD contract entitlement. The methodology for estimating expected allocation reductions is shown in Appendix A of the Feasibility Study for the project (RMC 2014).

supplies or the average of contractual water supplies over the last five years, the average shortfall would range from approximately 40,000 to 60,000 AFY. The 2014 shortfall is 90,000 AFY.

Figure 1-3: DPWD Water Supplies and Shortfalls

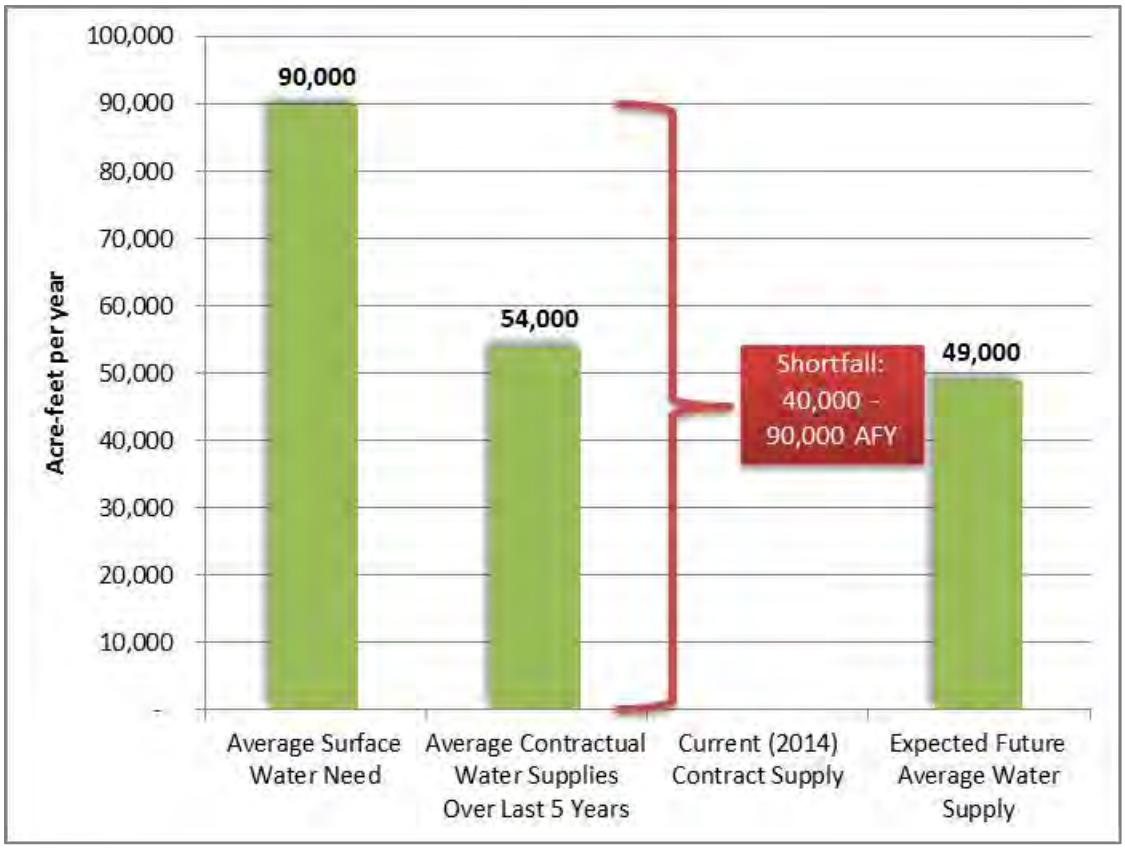
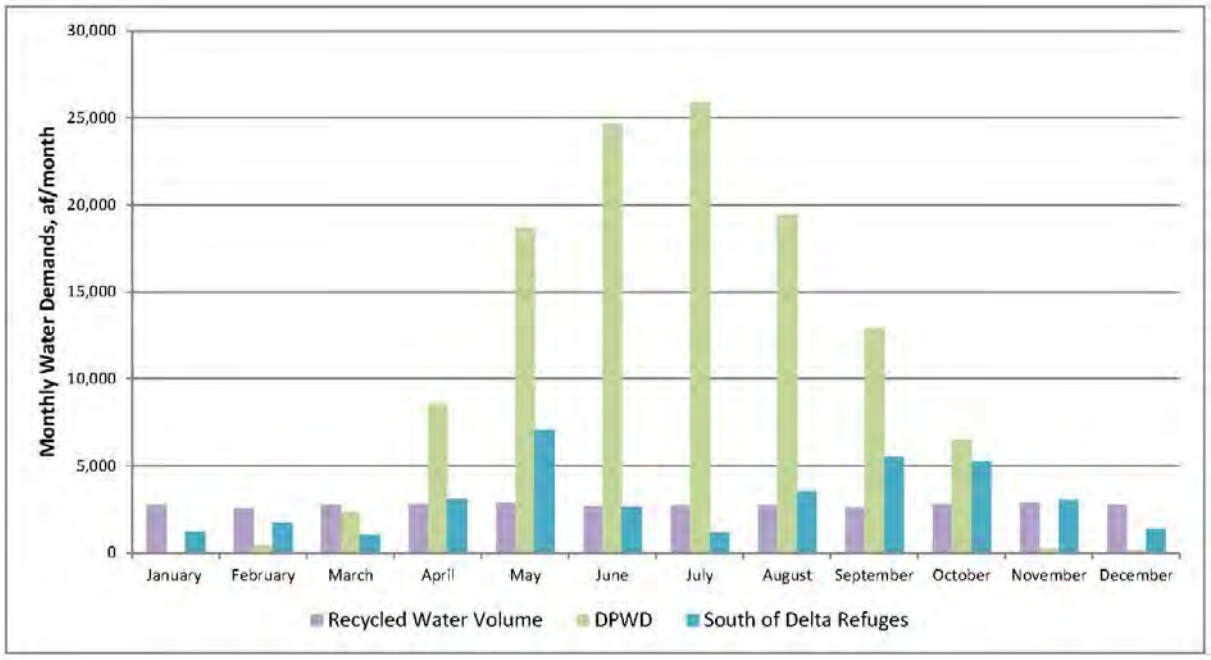


Figure 1-4: Projected Monthly Demands from DPWD and Refuges and Monthly Volume of Recycled Water Production

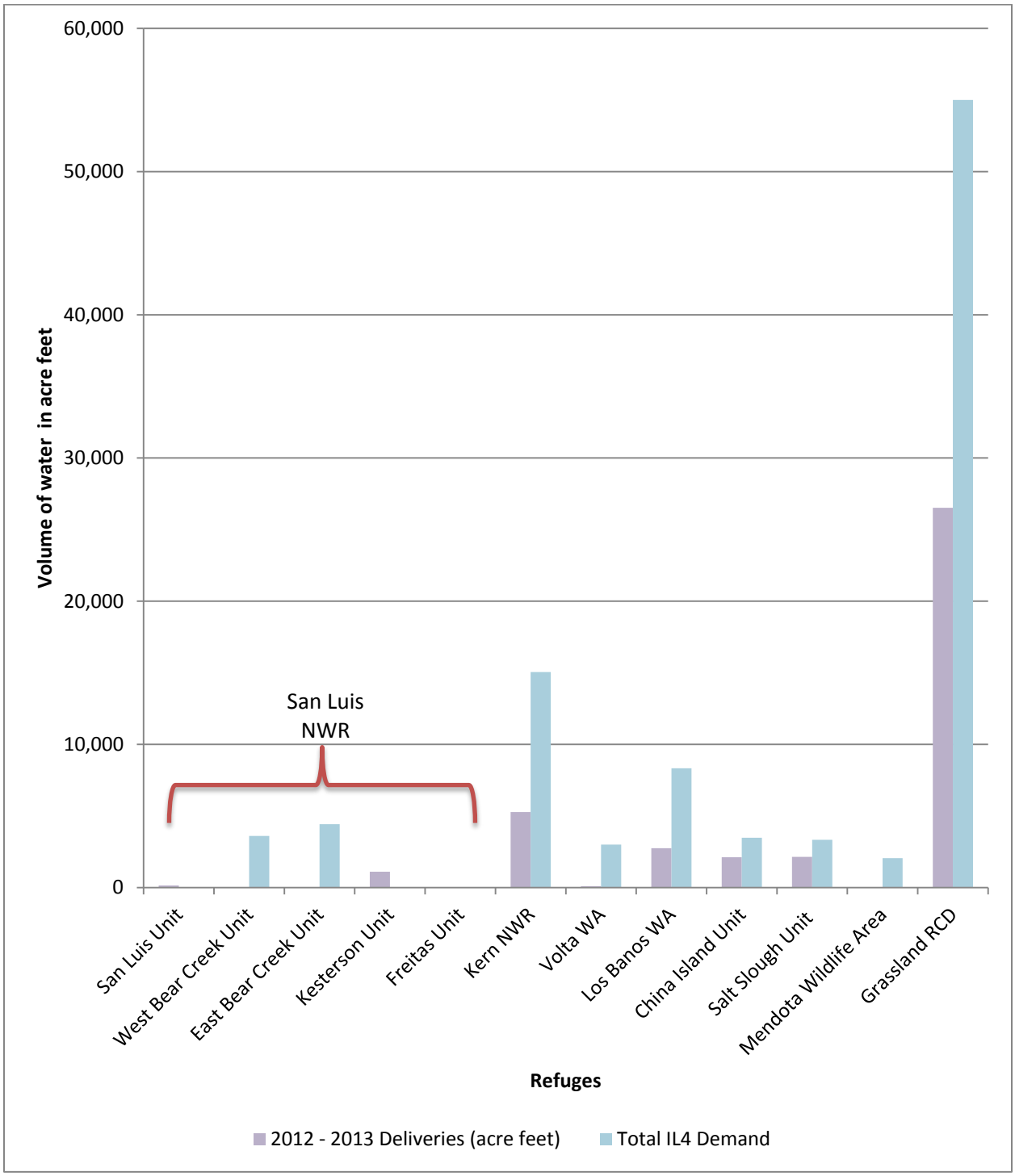


1.1.3 South of the Delta Refuges Water Needs and Descriptions

Refuges Need for Additional Water Supply

In addition to provision of water to the DPWD service area, the NVRRWP would make recycled water available to certain SOD CVPIA designated federal National Wildlife Refuges (NWRs), State Wildlife Areas (SWAs), and one privately-managed wetland (Grassland Resource Conservation District), collectively referred to herein as "refuges". Reclamation has a legislative obligation under the CVPIA, in cooperation with the U.S. Fish and Wildlife Service (USFWS), the California Department of Fish and Wildlife (CDFW), the Grassland Water District (GWD), and the Central Valley Joint Venture (CVJV) to provide firm, average annual historical water deliveries (Level 2, or L2) of suitable quality to maintain the refuges' habitat areas. In addition to L2 deliveries, an additional increment of water supply is needed for optimal wildlife management (commonly known as Incremental Level 4, or IL4, water). Provision of adequate and reliable water supplies (L2 and IL4) for the refuges to meet the CVPIA-mandated water levels has not been achieved "due in large part to state and federal budget shortages, inconsistency in the timing of water deliveries, and increases in the costs of blocks of water made available annually from willing sellers on the open market" (CVJV 2006). Based on information provided by Reclamation, an annual allocation of 271,001 AF of L2 and 105,514 AF of IL4 water supplies (a total of 376,514 AF) is required for delivery to the SOD refuges (Reclamation 2013a). In the 2012-2013 time period, Reclamation delivered 270,294 AF of L2 water supplies, which is close to the amount required. Regarding the SOD refuges' IL4 water quantity, however, the average annual amount delivered between 2002 and 2012 was 63,233 AF or about 60% of the total IL4 water (105,514 AF) required. **Figure 1-5** shows the IL4 demand for refuges that could be served by the project, as compared to the actual amount of water delivered in the 2012-2013 water year. The NVRRWP could not serve the full IL4 demand, but could help reduce the shortfall.

Figure 1-5: Refuge IL4 Water Demand vs Actual IL4 Deliveries



Source: Reclamation 2013b

Refuges that Could be Served by the NVRRWP

The SOD refuges contain habitat that supports a variety of birds and wildlife species, and are an important part of the Pacific Flyway, a major migration route for migratory birds. The NVRRWP could potentially

benefit the refuges shown in **Table 1-1**. As shown in **Figure 1-4**, refuges need water year-round, however, their fall and winter water demand occurs in a season when there is less of a need for irrigation water.

Table 1-1: Potential SOD Refuge Beneficiaries

National Wildlife Complex and Refuges	Wildlife Areas	Other
San Luis National Wildlife Complex	Volta WA	Grassland Resources Conservation District
East Bear Creek Unit	Mendota WA	
Freitas Unit	Los Banos WA	
Kesterson Unit	North Grasslands WA	
San Luis Unit	*Salt Slough Unit*	
West Bear Creek Unit	*China Island Unit*	
Kern NWR		

1.1.4 Recycled Water Sources and Availability

DPWD's service area is located a little over five miles from Modesto's discharge location at the Jennings Wastewater Treatment Plant (Jennings Plant) and less than five miles from the end of Turlock's Harding Drain Bypass Pipeline, which currently conveys flows from the Turlock Regional Water Quality Control Facility (RWQCF) to a discharge point located on the San Joaquin River. These cities either already have upgraded or are in the process of upgrading their facilities to treat wastewater to recycled water standards to meet San Joaquin River discharge requirements in their respective National Pollutant Discharge Elimination System (NPDES) permits.

By 2045, Modesto and Turlock will produce up to 59,000 AFY of recycled water, as shown in **Table 1-2**. Recycled water would be provided incrementally as treatment facilities are expanded and flows increase from projected population growth.

Table 1-2: Recycled Water Availability at at Buildout

Agency	Recycled Water (AFY)	Recycled Water (mgd)
Modesto	30,600	27.5
Turlock	28,400	25.4
Total	59,000	52.9

Source: RMC, 2013

City of Modesto (Modesto)

The City of Modesto provides primary treatment at the Sutter Wastewater Treatment Plant; primary effluent is then conveyed to the Jennings Road Secondary Treatment Facility (Jennings Plant), where facultative ponds are used to produce secondary effluent. The secondary effluent is applied to Modesto-owned ranch land (approximately 2,500 acres) or is discharged to the San Joaquin River from October 1 through May 31, when river flows provide a 20:1 dilution ratio. There are two storage ponds at the Jennings Plant that provide about 7,800 AF of seasonal secondary effluent storage when effluent cannot be discharged to the river or land-applied.

In response to new effluent discharge requirements imposed by the Central Valley Regional Water Quality Control Board (CVRWQCB), the City of Modesto added biological nutrient removal (BNR) and

tertiary treatment to a portion of its flow at the Jennings Plant. BNR will provide a high quality source of recycled water. Phase 1 of the treatment upgrades was completed in 2010 and provides 2.3 million gallons per day (mgd) of tertiary effluent, all of which is applied to Modesto-owned ranch land. The Phase 2 treatment facilities are scheduled to be online by February 2016 and will provide an additional 12.6 mgd of tertiary treatment capacity, bringing the total capacity to 14.9 mgd. Modesto is planning to continue to increase tertiary treatment capacity to 27.5 mgd by build-out and this water would be available for the proposed project. No tertiary treated water produced by Modesto is presently discharged to the San Joaquin River.

The treatment process used for BNR at the Modesto facility is the membrane bioreactor (MBR) process. The MBR process contains two steps. The first step is the activated sludge process, which takes place in the BNR aeration basins. The BNR aeration basins grow the biomass (bacteria and microorganisms) that provides treatment. The second step is to separate out the solids and clean water from the biomass. This is achieved with membranes. The MBR system is designed to remove biochemical oxygen demand, and the nutrients ammonia and nitrates/nitrites. Filtered water that has passed through the membranes will be disinfected with UV light radiation. By 2016, with the completion of the Phase 2 treatment facilities, a new effluent pump station and pipeline will convey final effluent from the treatment facilities to the current point of discharge at the San Joaquin River.

City of Turlock (Turlock)

The City of Turlock's RWQCF has a treatment capacity of 20 mgd of tertiary-treated water. Turlock currently discharges an average annual flow of 10 mgd to the San Joaquin River via the Harding Drain Bypass Pipeline, consistent with the city's NPDES permit requirements.

Constructed in 2013, the primary goal of the Harding Drain Bypass Pump Station and Pipeline Project was to eliminate the discharge of treated wastewater to the Harding Drain, which is an open channel owned by Turlock Irrigation District (TID), and discharge directly to the San Joaquin River. Changing the point of discharge from Harding Drain to the San Joaquin River serves at least two beneficial purposes. First, removal of the City's permitted wastewater discharges from Harding Drain relieved the City of the need to coordinate with TID regarding management of wastewater flows in the Harding Drain, allowing TID to more efficiently operate and maintain its system. Second, the project allows TID and agricultural operations that discharge to Harding Drain to separately monitor and manage water quality associated with agricultural activities, which are subject to separate regulatory requirements.

The Harding Drain Bypass Pump Station and Pipeline Project also allows Turlock to deliver recycled water to other beneficial uses, potentially minimizing and/or eliminating wastewater discharges to the San Joaquin River. Turlock estimates that by buildout year of 2030, 25.4 mgd will be available after other currently existing recycled water contractual commitments have been fulfilled. These commitments include a 50-year contract with the TID-owned Walnut Energy Center for 2 mgd as well as the Turlock-owned Pedretti Park for 0.1 mgd with no expiration date.

The treatment process at the Turlock facility consists of primary sedimentation, biotowers, aeration basins, and secondary clarifiers. The clarified effluent then flows to the secondary effluent equalization basins for subsequent pumping into the tertiary treatment system. Tertiary treatment facilities consist of filtration using a proprietary cloth disk system, chlorine-disinfection, and dechlorination prior to discharge. The facility provides ammonia removal to meet its discharge permit requirements; however unlike the Modesto facility, the Turlock facility does not remove nitrates/nitrites from the effluent.

1.1.5 Delta-Mendota Canal (DMC)

Completed in 1951, the DMC carries CVP water southeasterly from the Tracy (C.W. "Bill" Jones) Pumping Plant along the west side of the San Joaquin Valley, delivering water for irrigation and municipal uses, as well as for wildlife refuges en route. Water from the DMC replaces San Joaquin River

flows in the Mendota Pool. The DMC also transports CVP water to the O'Neill Forebay for delivery to the San Luis Unit. The canal extends 70 miles from the Sacramento-San Joaquin Delta to the O'Neill Forebay and then 46 miles to the Mendota Pool on the San Joaquin River, about 30 miles west of Fresno. The initial diversion capacity is 4,600 cubic feet per second (cfs), which is gradually decreased to 3,211 cfs at the terminus.

The SLDMWA has operated the DMC and associated facilities for Reclamation since 1992. Members of the SLDMWA, which receive water supplies for irrigation and municipal uses, include:

Banta-Carbona Irrigation District	Broadview Water District
Byron Bethany Irrigation District (CVPSA)	Central California Irrigation District
City of Tracy	Columbia Canal Company
Del Puerto Water District	Eagle Field Water District
Firebaugh Canal Water District	Fresno Slough Water District
Grassland Water District	Henry Miller Reclamation District #2131
James Irrigation District	Laguna Water District
Mercy Springs Water District	Oro Loma Water District
Pacheco Water District	Panoche Water District
Patterson Irrigation District	Pleasant Valley Water District
Reclamation District 1606	San Benito County Water District
San Luis Water District	Santa Clara Valley Water District
Tranquility Irrigation District	Turner Island Water District
West Side Irrigation District	West Stanislaus Irrigation District
Westlands Water District	

Over the past ten years, water conveyed in the canal (as measured at the Jones Pumping Plant), has varied from a high of 4.5 million AF for the 2006 water year to a low of 0.75 million AF in the 2005 water year. Reclamation routinely monitors water quality in the DMC for selenium and other inorganic and organic constituents.

1.1.6 San Luis Reservoir

The DMC is connected to the San Luis Reservoir via O'Neill Forebay midway along the length of the canal. This 2 million-AF artificial lake on San Luis Creek in the eastern slopes of the Diablo Range of Merced County is jointly owned and operated by Reclamation and the California Department of Water Resources (DWR) and is one of California's largest reservoirs (Reclamation 2013c). During the summer or dry season, water in San Luis Reservoir is used by CVP contractors, as well as State Water Project contractors. Tertiary-treated water conveyed into the DMC during low-demand periods could be stored in the SOD CVP system, which includes San Luis Reservoir. Any such storage of recycled water would occur after the water has been blended with flows in the DMC.

1.1.7 Recycled Water Quality

Recycled water from the Modesto and Turlock treatment facilities is suitable for all currently allowed uses of recycled water, including irrigation of public parks and food crops. Although recycled water discharged to the DMC would not technically be required to meet criteria that are established by the California Department of Public Health (CDPH), it would have to meet the standards of the NPDES Permit for discharge issued by the RWQCB. As such, recycled water from both Modesto and Turlock would still be oxidized, filtered, and adequately disinfected, pursuant to the CDPH reclamation criteria, CCR, Title 22, division 4, chapter 3, (Title 22) or equivalent.

The Cities of Modesto and Turlock are pursuing revised NPDES permits to allow discharges to the DMC[3]. It is expected that the CVRWQCB would address the full range of beneficial uses of the DMC as delineated in the Central Valley Basin Plan when considering issuance of an NPDES permit. Recycled water from the NVRRWP would also have to comply with Reclamation's water quality standards for the Upper DMC. The Cities' discharges would have to meet any standards established by the CVRWQCB and by Reclamation before initiating project operations.

1.1.8 San Joaquin River

Consistent with the Central Valley Basin Plan (Basin Plan), current designated beneficial uses of the San Joaquin River downstream of the Turlock and Modesto discharges (from the mouth of the Merced River to Vernalis) include:

- Municipal and Domestic Supply (potential beneficial use; not existing in current Basin Plan)
- Agricultural – Irrigation and Stock Watering
- Industrial Process Supply
- Recreation – Water Contact, Canoeing/Rafting, and Other Non-Contact Water Recreation
- Freshwater Habitat- Warm Water Ecosystems
- Migration of Aquatic Organisms – Warm and Cold
- Spawning, Reproduction, and/or Early Development of Fish – Warm
- Wildlife Habitat

In addition, since the mid-1990s Reclamation has been operating the CVP to meet the Vernalis salinity objectives. The water quality objective is 1000 µmhos/cm 30-day running average of mean daily electrical conductivity (EC) from September 1 through April 29 and a 700 µmhos/cm 30-day running average of mean daily EC from April 30 through August 31. The Department of Water Resources and the United States Geological Survey, in partnership with Reclamation, have been participating in the San Joaquin River Real-Time Water Quality Program to perform ongoing work to facilitate the control and timing of wetland and agricultural drainage to coincide with periods when dilution flow is sufficient to meet the Vernalis salinity objectives. The water saved through this optimization can be used later to increase San Joaquin River basin streamflow during critical periods for anadromous fish restoration efforts.

1.1.9 Water Rights

Implementation of the NVRRWP would require that the Cities of Modesto and Turlock obtain approval of a Wastewater Change Petition(s) from the State Water Resources Control Board, Division of Water Rights. Approval of the petition(s) would establish a water right for the recycled water, and would enable a change in the point of discharge from the San Joaquin River to the DMC. The City of Modesto submitted its Wastewater Change Petition in July 2014. The City of Turlock is currently discharging to the San Joaquin River and has submitted an application to the Division of Water Rights to appropriate and divert an equivalent quantity of water at the Patterson Irrigation District intake, downstream of Turlock's current discharge point for delivery to DPWD in the interim period. It is expected that as part of implementation of the NVRRWP, the City of Turlock would subsequently submit a Wastewater Change Petition to allow the existing discharge to be re-routed directly to the DMC.

[3] Both cities would retain their existing discharge locations and access at the San Joaquin River. However, under the proposed project, water would not be discharged to the river under normal circumstances.

1.2 Purpose and Need

One of the authorized purposes of CVP is to provide water for irrigation and domestic use within California's Central Valley. In recent years, south of the Delta CVP contractors and CVPIA-designated wildlife refuges have experienced an increased reduction in CVP water allocations from historical amounts due to drought conditions and expanded Delta pumping restrictions. As a CVP contractor, DPWD has a need to establish alternative, reliable long-term agricultural water supplies to offset these reductions. Also CVPIA Sections 3406(b)(3) and 3406(d)(2) direct Reclamation to acquire and provide supplemental water to all CVPIA designated wildlife refuges in the Central Valley. The purpose of the project is to make the Cities' recycled water available to DPWD for agricultural purposes and to SOD refuges for wetland habitat purposes in support of migratory birds..

1.3 CEQA Objectives

The overall objective of the proposed project is to maximize beneficial use of a sustainable, alternative water supply within the region, which would address reductions in water supplies from the CVP and reduce the reliance on groundwater use. Specifically, the objectives of the project are as follows:

- Establish an alternative, reliable, long-term water supply of up to 59,000 acre feet per year (AFY) of recycled water for DPWD and refuges;
- Maximize beneficial use of recycled water by DPWD customers and refuges;
- Maximize Project Partners' control of operations and delivery of water to DPWD and refuges, while recognizing the need for coordination with Reclamation and the San Luis & Delta-Mendota Water Authority;
- Establish long-term water right(s) to allow for the beneficial use of recycled water;
- Maximize use of existing facilities for treatment/delivery of recycled water;
- Provide supplemental water supplies annually to SOD refuges to meet CVPIA Sections 3406(b)(3) and 3406(d)(2) requirements;
- Avoid or minimize, through incorporation of design constraints and management practices, impacts to environmental resources such as surface water, groundwater supplies, land subsidence, groundwater quality and biological resources including sensitive species; and
- Deliver agricultural water to DPWD at a cost that supports regional economic sustainability.

The proposed project is needed to offset the significant reduction in CVP water allocations to DPWD associated with Delta pumping restrictions, drought conditions, and climate change. In addition, the proposed project is needed to offset anticipated effects (e.g., overdraft, subsidence, water quality issues) from increased groundwater pumping that have occurred and would likely continue to occur with the absence of an alternative water supply.

1.4 Compliance with CEQA and NEPA

This document is a joint EIR/EIS and has been prepared to satisfy the requirements of both the California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA). The proposed project/action is a discretionary action under the CEQA Guidelines Section 15357 and would require several actions on the part of Reclamation, including potential project funding under Title XVI (federal actions are described in *Chapter 2, Alternatives and Proposed Project/Action*). As such, the NVRRWP is subject to the requirements of CEQA and NEPA. The joint environmental document was prepared pursuant to CEQA Public Resources Code, Division 13, Environmental Protection; the CEQA Guidelines; and the Council on Environmental Quality (CEQ) Regulations for Implementing the National Environmental Policy Act (Parts 1500 to 1508). The EIR/EIS serves to publicly disclose the

environmental consequences and potential impacts/effects of a range of alternatives on the environment, including the no project/no action alternative. The joint environmental document also provides the public, responsible, and trustee agencies[4] with information about the potential effects on the local and regional environment associated with implementation of the proposed project/action.

CEQA requires the lead agency to identify each "significant effect on the environment" resulting from the project and ways to mitigate each significant effect. If the project may have a significant effect on any environmental resource, then an EIR must be prepared. Each significant effect on the environment must be disclosed in the EIR and feasible mitigation proposed. In addition, the CEQA Guidelines list a number of mandatory findings of significance, which also require the preparation of an EIR.

1.4.1 NEPA Lead Agency

Reclamation is the lead agency under NEPA for the NVRRWP. Because implementation of the NVRWWP would require several actions on the part of Reclamation, including possible funding, this document has been prepared in compliance with NEPA and the Council on Environmental Quality (CEQ)'s NEPA implementing regulations (Title 40, Code of Federal Regulations [CFR], Section 1500 et seq.). See *Section 2.1, Proposed Federal Actions*, for a description of federal actions. The EIR/EIS has also been prepared consistent with Reclamation's NEPA Handbook (Reclamation 2012).

1.4.2 CEQA Lead Agency

The City of Modesto is the lead agency under CEQA for the NVRRWP. The City of Modesto is working with the City of Turlock and DPWD (Partner Agencies) in implementing the NVRRWP. Each of the Partner Agencies is a responsible agency under CEQA and would rely on the EIR/EIS in determining whether to approve the project.

1.5 Intended Use of the EIR/EIS

Reclamation intends to use this EIR/EIS to consider provision of federal funding for the NVRRWP. As lead federal agency, Reclamation would use this EIR/EIS to support issuance of a Record of Decision, which would document Reclamation's decision to fund and/or approve the NVRRWP. The EIR/EIS would support other possible actions by Reclamation, which are described in *Section 2.1, Proposed Federal Actions*. Other federal agencies, such as the U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, and National Marine Fisheries Service may use the EIS to satisfy NEPA for their individual approvals of project components.

The Partner Agencies would use this EIR/EIS to approve the NVRRWP and/or its components, make Findings regarding any identified impacts, and if necessary, to adopt a Statement of Overriding Considerations regarding any significant unavoidable impacts.

The information in the EIR/EIS would also be used to support the acquisition of regulatory permits or approvals. **Table 1-3** summarizes the potential permits and/or approvals from other agencies that may be required prior to construction of the proposed project.

[4] A responsible agency is an agency other than the lead agency that has a legal responsibility for also carrying out or approving a project; a responsible agency must actively participate in the lead agency's environmental process, review the lead agency's environmental document, and use that document when making a decision on the project. Trustee agencies have jurisdiction over certain resources held in trust for the people of California but do not have a legal authority over approving or carrying out a project.

Table 1-3: Responsible and Trustee Agencies and Coordination

Agency	Type of Approval
FEDERAL	
Reclamation	Warren Act Contract
Reclamation	Possible funding through Public Law 102-575, Title XVI
Reclamation	Land Use Authorization for Construction of Facilities within DMC right-of-way (ROW)
Reclamation	Purchase contract for supplemental supplies for Refuge Water Supply Program under CVPIA Section 3406(d)(2)
U.S. Army Corps of Engineers	Clean Water Act, Section 404 Permit for any fill of wetlands or waters of the US
U.S. Army Corps of Engineers	Section 10 Permit for pipeline crossing under San Joaquin River, which is a navigable waterway.
U.S. Fish and Wildlife & National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service	Section 7 Consultation/Biological Opinions
Natural Resource Conservation Service	Farmland Conversion Assessment
STATE	
State Water Resources Control Board	Wastewater Change Petition (Petition for Change)
California Department of Fish and Wildlife (CDFW)	Streambed Alteration Agreement for pipeline crossings of streams
CDFW	Incidental Take Permit for California Endangered Species Act (CESA)
CalOSHA	Construction Permit / Tunnel Classification
CA Office of Historic Preservation	Section 106 Consultation
CA State Lands Commission	Lease Agreement
Caltrans	Encroachment Permit
Central Valley Regional Water Quality Control Board (CVRWQCB)	Clean Water Act, Section 401 Water Quality Certification
CVRWQCB	Notice of Intent for coverage under Statewide Construction Stormwater Permit (Section 402 Clean Water Act)
CVRWQCB	Notice of Intent for coverage under Low-Threat Discharge Order for Dewatering during Construction and for Pipeline Discharges for Testing and Startup
CVRWQCB	NPDES Permit for Discharge to the DMC
Central Valley Flood Protection Board	Possible encroachment permit
LOCAL	
San Joaquin Valley Air Pollution Control District	Authority to Construct / Permit to Operate
Stanislaus County	Encroachment permit, grading permit, building permit, and tree removal permit
Stanislaus County	Williamson Act cancellation (if needed)
Genesee & Wyoming Railroad	Utility Occupancy License for crossing of CFNR

1.6 Organization of the EIR/EIS

This Draft EIR/EIS is organized into the following Chapters:

Executive Summary. This chapter includes a summary of the NVRRWP and the alternatives evaluated in this EIR/EIS. It includes a table that summarizes the impacts, mitigation measures, and levels of significance after mitigation measures are incorporated.

Chapter 1: Introduction. This chapter provides an introduction and overview describing the project objectives, purpose and scope of the Draft EIR/EIS, intended uses of the EIR/EIS, including a list of responsible agencies and approvals, brief explanation of areas of controversy and issues to be resolved, and a summary of the CEQA/NEPA review process.

Chapter 2: Alternatives and Proposed Project/Action. This chapter presents a detailed description of the proposed NVRRWP, including a description of proposed facilities and construction and operational considerations.

Chapter 3: Affected Environment/Environmental Setting, Environmental Consequences/Impacts and Mitigation Measures. This chapter analyzes the environmental consequences and impacts of the proposed project/action to satisfy the requirements of both NEPA and CEQA, respectively. Each topic includes a description of the affected environment/environmental setting, regulatory setting, methodology, thresholds of significance, impacts (both project-specific and cumulative), mitigation measures, and significance after mitigation. Chapter 3 includes subsections addressing each environmental resource.

Chapter 4: Other NEPA and CEQA Considerations. This chapter identifies any direct or indirect impacts, significant and unavoidable impacts, the project's irreversible and irretrievable commitment of resources, and growth-inducing impacts for environmental compliance of both NEPA and CEQA. The impacts of alternatives are summarized so as to allow identification of the environmentally preferable/superior alternative.

Chapter 5: Consultation, Coordination and Compliance. This chapter addresses compliance with federal statutes and regulations, summarizes the scoping process, and identifies the distribution of the EIR/EIS, and opportunities for future public involvement.

Chapter 6: Report Preparation. This chapter lists the authors of the EIR/EIS.

1.7 CEQA/NEPA Process and Review

1.7.1 Notice of Intent

In accordance with 40 CFR 1508.22, a Notice of Intent (NOI) was published by Reclamation in the Federal Register on April 22, 2014. During the 36-day public review period a public scoping meeting was held, which is described below. During the NOI public review period, which ended on May 28, 2014 Reclamation received six written comments.

1.7.2 Notice of Preparation

In accordance with Section 15082 of the CEQA Guidelines, a Notice of Preparation (NOP) was submitted to the State Clearinghouse (State Clearinghouse # 2014042068) and circulated to local, state and federal agencies on April 22, 2014. The NOP was available online on the NVRRWP website. Postcard notification of the NOP's availability was mailed to 116 organizations and individuals, and the NOP was published in the local newspaper, The Modesto Bee.

1.7.3 Public Scoping

Scoping Meeting

A scoping meeting for the NVRRWP was held on May 13, 2014 as described below:

Modesto City Hall
1010 Tenth Street
Modesto, CA
3:00 to 7:00 pm

The time and location of the scoping meeting were included in the postcards announcing the availability of the NOP and NOI, in the public notice placed in The Modesto Bee, as well as in a joint press release that was sent to local media outlets. An announcement of the meeting was published in the "News & Notes" section of the newspaper. The scoping meeting was held in an open house format, and comment cards were provided for those attending the meeting to facilitate submittal of written comments. At the scoping meeting, the NVRRWP was presented to the public through use of graphic displays showing maps, pipeline alignments, and information about project objectives, purpose and need, and proposed uses of recycled water. The graphic displays used at the meeting were also made available to the public on the NVRRWP website.

Areas of Controversy/Issues to be Evaluated

Comments received in response to circulation of the NOP and NOI are included in **Appendix A**. Written comments were received from three private citizens and from the following federal, state and regional/local agencies:

- U.S. Army Corps of Engineers
- U.S. Environmental Protection Agency
- State Water Resources Control Board
- California Department of Fish and Wildlife
- California State Lands Commission
- Central Valley Regional Water Quality Control Board
- Turlock Irrigation District
- Stanislaus County Planning and Community Development Department
- Stanislaus County Environmental Review Committee
- San Joaquin Valley Air Pollution Control District.

Comments included questions about the project description and about effects on water quality, water supply, and groundwater recharge flows and patterns. All of these issues are evaluated in this Draft EIR/EIS.

The only area of controversy identified during scoping was the use of recycled water in the Delta-Mendota subbasin for which the Turlock Irrigation District suggested an alternative that would provide recycled water to users in the Turlock subbasin.

1.7.4 Public Review of EIR/EIS

Draft EIR/EIS

This Draft EIR/EIS is being made available to local, state and federal agencies and to interested organizations and individuals who may wish to review and provide comment. Notices of Availability have been distributed to agencies, organizations and individuals who have expressed interest in being

included on the project mailing list. Publication of this Draft EIR/EIS begins a 45-day public review period, during which comments may be directed to the addresses below. During the public review period, the Partner Agencies will hold a public hearing on the Draft EIR/EIS.

City of Modesto, Utilities Department
Attn: William Wong,
Engineering Division Manager
1010 Tenth Street, Suite 4500
Modesto, CA 95354

U.S. Department of the Interior
Bureau of Reclamation, SCCAO
Attn: Ben Lawrence,
Natural Resource Specialist
1243 "N" Street
Fresno CA 93721-1813

Final EIR/EIS

Comments received during the public review period will be addressed in a Response to Comments document, which together with the Draft EIR/EIS, will constitute the Final EIR/EIS. Reclamation will then use the document to support a Record of Decision to document Reclamation's decisions regarding the various potential federal actions for the project, which are described in *Chapter 2, Alternatives and Proposed Project/Action*. As the CEQA Lead Agency, the City of Modesto will consider certifying the EIR as complete under CEQA Guidelines Section 15090. The NVRRWP Partner Agencies, as responsible agencies, will consider the certified EIR/EIS when making their decisions about whether to approve the project. Project approvals would require that the CEQA lead agency and Partner Agencies make written findings with respect to any significant effects relevant to implementation of their portion of the project identified in the EIR/EIS.

1.8 References

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Chapter 2 Alternatives and Proposed Project/Action

Del Puerto Water District, City of Modesto, and City of Turlock (collectively, the Partner Agencies) propose to provide a new source of water to agricultural lands on the west side of the San Joaquin River in San Joaquin, Stanislaus and Merced Counties, south of the Sacramento-San Joaquin River Delta (Delta), and to certain CVPIA-designated SOD refuges (see **Figure 2-1**). Specifically, the Proposed Project/Action would introduce and convey, on a space available basis, up to 59,000 acre-feet per year (AFY) of recycled water produced by the cities of Modesto and Turlock directly into the Delta-Mendota Canal (DMC), which is owned by Reclamation. The recycled water would then be conveyed directly to DPWD customers or stored in Reclamation facilities during low water demand periods. In addition to uses within DPWD's service area, the Proposed Project/Action would provide water to certain CVPIA SOD wildlife refuges and wetland areas to meet their need for supplemental water supply. This EIR/EIS assesses the environmental effects of the North Valley Regional Recycled Water Program (NVRRWP or proposed project/action). Three action alternatives will be evaluated at an equal level of analysis, including two pipeline corridor alternatives that convey recycled water produced by the cities of Modesto and Turlock directly to the DMC and a third action alternative that would use the San Joaquin River and an expanded Patterson Irrigation District (PID) system for conveyance.

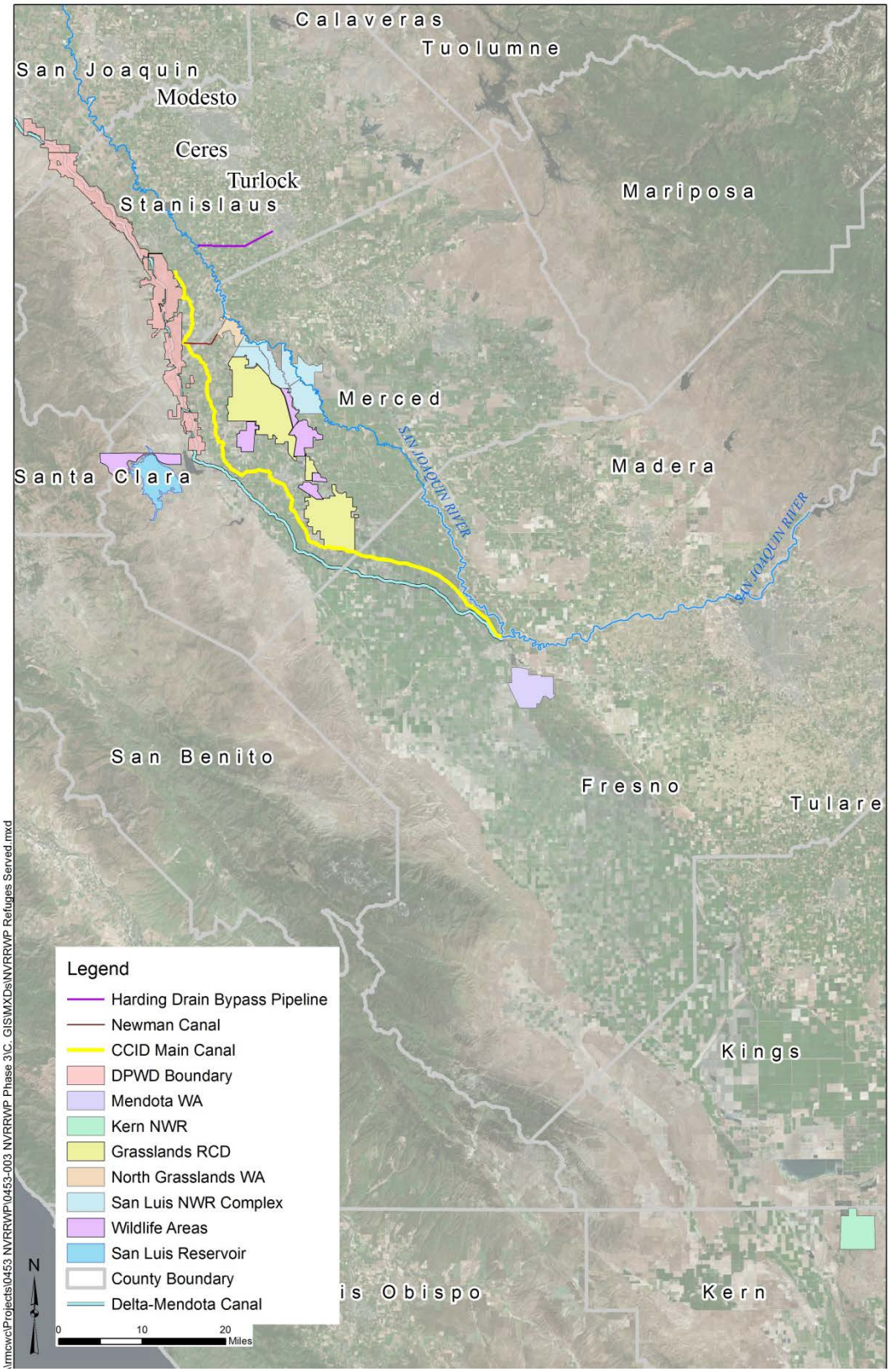
2.1 Proposed Federal Actions

The investigation and development of the NVRRWP is being carried out in conformance with Public Law 102-575, Title XVI, which provides a mechanism for federal participation and cost-sharing in approved water reuse projects (if specifically authorized by Congress) and with the CVPIA, Public Law 102-575, Title 23, Section 3406(d), which provides authorization for Reclamation to acquire supplemental water for refuges. In addition to funding, a long-term Warren Act Contract between Reclamation and DPWD would be required to convey recycled water in the DMC for delivery to DPWD and to provide for storage in San Luis Reservoir. In order to facilitate the storage component of the contract, an operational exchange would be required for DPWD to take delivery of stored water out of San Luis Reservoir. DPWD would need a license from Reclamation to construct and maintain the DMC connector, which would be within Reclamation's right-of-way (ROW). The project would also require a temporary construction easement from Reclamation to allow construction activities and possible staging in the area around the proposed discharge structure at the DMC. Reclamation would work with DPWD to obtain supplemental water supplies (such as Incremental Level 4) from the NVRRWP for delivery to SOD wildlife refuges. This EIS addresses a number of potential actions by Reclamation: provision of funding under Title XVI and/or CVPIA Section 3406(d), execution of a long-term Warren Act Contract, a license for construction and use of a discharge structure at the DMC, and an agreement with the Refuge Water Supply Program.

2.2 Project Location

The Proposed Project/Action is located within San Joaquin, Stanislaus and Merced Counties, as shown in **Figure 2-1**. Proposed Project/Action facilities, consisting of pipelines, pump stations, and appurtenance improvements would generally be located about eight miles west of the cities of Modesto and Turlock, in Stanislaus County, though all work within the Jennings Wastewater Treatment Plant site would be within the jurisdictional boundaries of the City of Modesto. Water would be delivered to farms within DPWD's service area in San Joaquin, Stanislaus and Merced Counties, as well as to SOD refuges.

Figure 2-1: Overview of Project Location



2.3 Proposed Project Components

Pipeline and pump station infrastructure would be constructed to deliver recycled water from Modesto and Turlock's treatment facilities to the DMC. The water would then be distributed to DPWD's service area and downstream refuges. This EIR/EIS evaluates three alternatives, which differ based on how recycled water would be conveyed from the Turlock and Modesto treatment facilities to the DMC. Alternative 1 and Alternative 2 are both "pipeline corridor alternatives", which include construction of a new pipeline(s) to convey water to the DMC. Alternative 3 would use the San Joaquin River as the first segment and an expanded Patterson Irrigation District (PID) diversion and delivery distribution facility as the second segment to convey water to DPWD. The three alternatives considered are:

- Alternative 1: Combined Alignment Alternative
- Alternative 2: Separate Alignment Alternative
- Alternative 3: PID Conveyance Alternative; Continued discharge to the San Joaquin River with diversion and delivery to the DMC via an expanded PID diversion and delivery system.

These alternatives were developed at two recycled water production rates (30,600 AFY available at the onset of the project in 2018, and 59,000 AFY at buildout in 2045). Both pipeline alternatives would avoid requirements for additional treatment upgrades at each City's treatment facility, have design capacity to convey all of the anticipated recycled water produced at buildout, use the CVP facilities to provide seasonal storage, and allow for delivery to the entire DPWD service area and refuges.

Both pipeline corridor alternatives would require that Modesto and Turlock obtain approval of Wastewater Change Petitions from the State Water Resources Control Board, Division of Water Rights pursuant to Section 1211 of the Water Code. Approval of the petitions would enable changes in the points of discharge from the San Joaquin River to the DMC. In reviewing and approving Petitions for Change, the Division of Water Rights must find that the proposed change would not injure other legal users of water, would not unreasonably harm instream uses, and would not be contrary to the public interest. All petitioners must send a copy of the petition to the California Department of Fish and Wildlife, and the Division will require public notice of the petition be provided to interested parties including other legal users of water. Protestants may raise concerns about protecting their water rights, or may raise public trust concerns. A protest sets forth the protestant's objections to approval of the petition. If the Division receives a protest, further review would be conducted. Both Modesto and Turlock would maintain their existing discharge locations at the San Joaquin River, as well as the NPDES permits for those discharges, but the project/action would reduce the amount of recycled water discharged to the San Joaquin River because the primary point of discharge would be changed to the DMC.

Because the PID Conveyance Alternative would continue discharge of recycled water to the San Joaquin River, water rights for this option would need to be established through a different approval process. Instead of a Wastewater Change Petition, Turlock and Modesto would need to acquire a new water right under Section 1485 of the California Administrative Code, which provides that agencies that discharge treated wastewater to the San Joaquin River can apply for a permit to appropriate an equal amount of water. Both Cities would need to obtain a water right to allow diversion of the recycled water from the river at the PID intake, which is downstream of the Turlock discharge location, but upstream of the Modesto's discharge. Because water would be diverted upstream of Modesto's discharge point, the process for establishing a water right for diversion at the PID intake may be complex. Depending on the water rights process, the project might require an exchange with a downstream diverter. Turlock would need to secure a water right for recycled water currently discharged to the San Joaquin River. Modesto would need to secure a water right for the portion of their recycled water currently discharged to the San Joaquin River (during winter months) and a water right for the portion of their recycled water that is currently land applied (during summer months), which would now be discharged to the river.

The primary difference between the alternatives is how the recycled water would be conveyed to the DMC. The two pipeline corridor alternatives would convey water completely within new pipelines. Alternative 1, the Combined Alignment Alternative, includes shared conveyance facilities between Turlock and Modesto. Alternative 1 would convey recycled water from Turlock's Harding Drain Bypass Pipeline to Modesto's Jennings Plant, where it would be combined and conveyed in one pipeline to the DMC (see **Figure 2-2**). Alternative 2, the Separate Alignment Alternative includes independent pipelines from each City's treatment facility to the DMC, as shown in **Figure 2-3**. One pump station would be needed for Alternative 1 and two pump stations would be needed for Alternative 2. Alternative 3 would utilize the San Joaquin River for a portion of the conveyance, and then rely on expanded PID diversion and conveyance facilities, as shown in **Figure 2-4**. A detailed description of the project components is provided below.

Figure 2-2: Combined Alignment Alternative (Alternative 1)

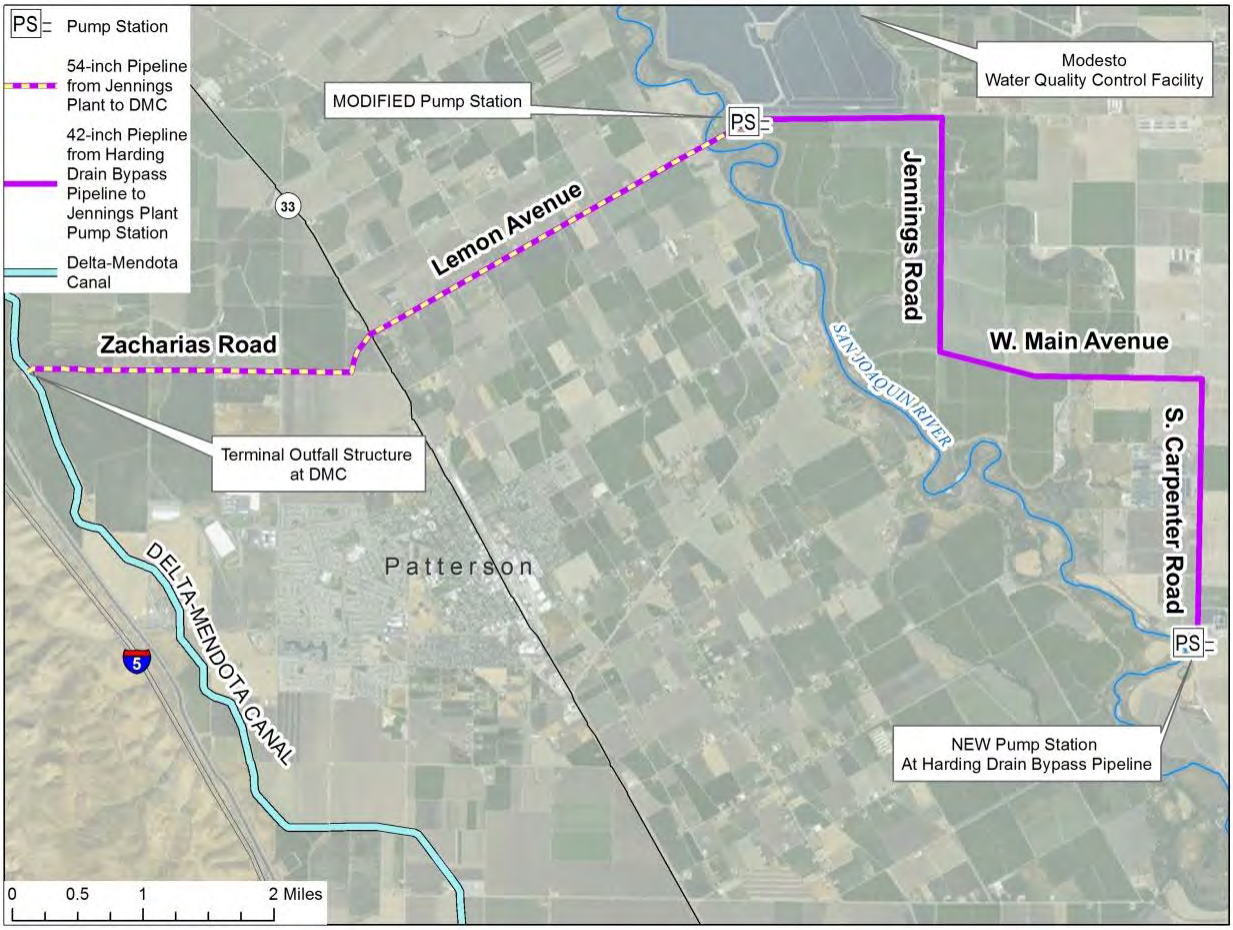


Figure 2-3: Separate Alignment Alternative (Alternative 2)

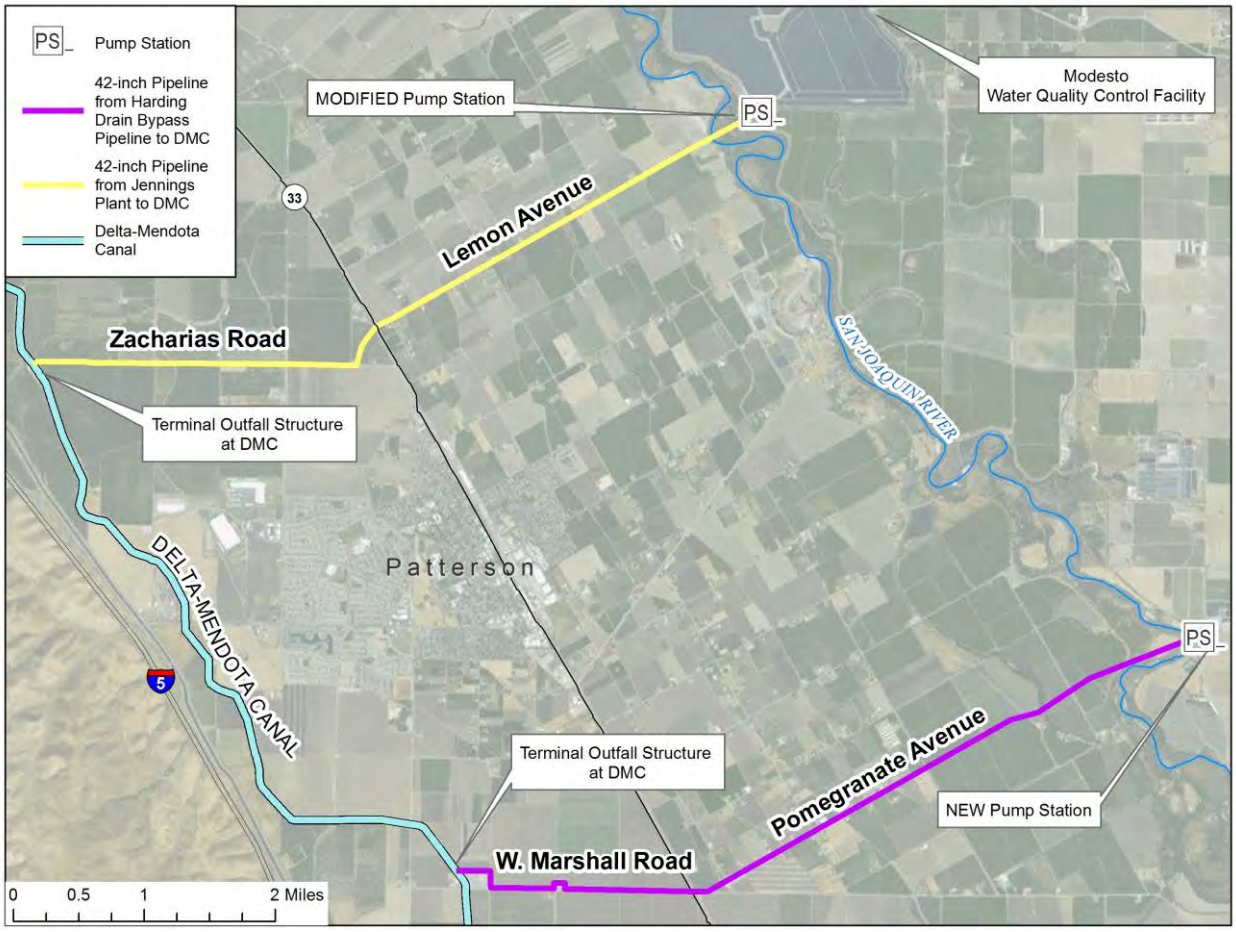


Figure 2-4: PID Conveyance Alternative (Alternative 3)

2.3.1 Pipelines and Appurtenances-Separate and Combined Alignment Alternatives

This section provides a discussion of the pipeline elements of both pipeline corridor alternatives, followed by a detailed description of each alternative.

The proposed pipeline corridor alternatives would be similar in length. The pipelines would vary from 36 to 54 inches in diameter and would likely be constructed of steel or reinforced concrete pipe. All pipelines would be equipped with air valves to release air from high points to prevent air binding that can reduce the pipeline capacity. Air valves may be located above or below ground. If located above ground, they would be housed on a concrete slab in a protective steel cage approximately 4 feet by 4 feet, on the shoulder of an adjacent road. If located underground, they would be located either within or on the shoulders of roadways in below-ground covered concrete vaults with vent pipes extending above-ground. Design and placement of air valves would be coordinated with Stanislaus County so as to ensure that vents would not interfere with potential future road widening projects such as the West Main Street Highway Improvement Project. Where feasible, air valves and vents could be located below ground so that it would be possible to construct a roadway on top of them, with appropriate venting through the pavement surface using a structure similar to a manhole. All pipelines would also be equipped with drain valves at low points in the pipeline to allow the pipelines to be drained for maintenance and repairs. Up to 30 drain valves could be required for each alternative, depending on topography. The drains would

discharge to land, or if permitted, to existing drainage or irrigation supply ditches along the pipeline alignments.

The pipeline corridor alternatives would require one or two crossings of the San Joaquin River, State Route 33 (SR 33), the California Northern Railroad Company (CFNR) railroad tracks, and multiple crossings of irrigation canals. In most instances, these crossings would use trenchless installation techniques, such as horizontal directional drilling (HDD) or tunneling to minimize surface effects to waterways or transportation. The crossing of SR 33 would be coordinated with potential future roadway improvements in the area so as to not interfere with possible widening of the roadway at the location of the pipeline crossing. The recommended trenchless installation method would be determined after geotechnical data are collected and evaluated during the design phase of the project. The proposed pipeline alternatives also run parallel and across a variety of underground and overhead utilities, including natural gas, fiber optic communication, cable, electricity, and water. Although the precise pipeline locations have not yet been determined, the proposed alignments would avoid major utilities and are expected to avoid minor utilities through their strategic placement within individual alignments. Any pipelines constructed in fields would require storage and stockpiling of topsoil, which would be replaced after pipeline installation. Pipeline placement would also meet the State of California Department of Public Health separation requirements. Because of the rural setting of the proposed project, there are no sewer mains along potential pipeline alignments (as the area uses septic systems), and there would be no conflicts with storm drain infrastructure, as there is none in the project area.

Alternative 1: Combined Alignment Alternative

The Combined Alignment Alternative consists of two reaches totaling 69,800 linear feet (see **Figure 2-2**). The south-north reach from the Harding Drain Bypass Pipeline would be 42 inches in diameter and would extend from the western end of the Harding Drain Bypass Pipeline near the existing standpipe structure on South Carpenter Road, then parallel South Carpenter Road north to West Main Street, then turn west on West Main Street to Jennings Road. At Jennings Road, the pipeline would then turn north for about 1.8 miles. From Jennings Road, the pipeline would then extend west along existing dirt roads through agricultural fields owned by Modesto and terminate at the existing Jennings Plant outfall pump station near the southeastern end of the Jennings Plant. Combined flows from the pumping facility at the Jennings Plant, which would be modified to meet capacity needs, would then travel in a 54-inch pipeline, cross under the San Joaquin River, and extend west to the DMC along Lemon Avenue, through farmland, and along Zacharias Road. **Table 2-1** shows the two segments and characteristics of each pipeline segment.

The proposed pipeline would cross a total of five irrigation canals along the Lemon Avenue alignment, all of which are operated by the PID. Construction would take approximately 21 months, starting in the fall of 2016.

Table 2-1: Alternative 1 - Combined Alignment Alternative Reach Characteristics

Segment	Approximate Length (feet)	Pipe size (inches)	Special Construction Considerations
Harding Drain Bypass Pipeline to Jennings Plant Pump Station – Segment 1			
South Carpenter Road between Harding Drain Bypass Pipeline and West Main Street	37,800	42	Potential for lane/road closure requiring detours and other traffic control. Potential lane/road closures along South Carpenter Road, West Main Avenue and Jennings Road. Crossing of West Main Avenue at South Carpenter Road may use trenchless technology.
West Main Street between South Carpenter and Jennings Road			
Jennings Road between West Main and agricultural field access road			
Agricultural field access road between Jennings Road and Jennings Plant Pump Station			
Jennings Plant Pump Station to DMC – Segment 2			
Open Space (including San Joaquin River and floodplain) between Jennings Plant and Lemon Avenue	32,000	54	Trenchless installation techniques such as HDD or tunneling of the pipeline would be required to cross under San Joaquin River to avoid the waterway and wetland resources.
Lemon Avenue between San Joaquin River and SR 33			Road closure anticipated along Lemon Avenue during construction, requiring detours. One segment of trenchless pipe would be required to cross both SR 33 and CFNR[1]. Trenchless method may be needed to cross irrigation canals.
Agricultural Fields from east side of SR 33 to west side of SR 33			
Zacharias Road from just west of SR 33 to DMC			
Total Length of two reaches	69,800		

Notes: The CFNR parallels SR 33 through much of the San Joaquin Valley, and spans the extent of the NVRRWP project bounds. The center line of SR 33 is approximately 75 feet away from the center line of the CFNR. Due to the proximity of the highway to the CFNR, it is assumed that a single trenchless pipe would be sized to span both crossings. The CFNR would require a protective casing for the pipe crossing under the railroad tracks.

Alternative 2: Separate Alignment Alternative

The Separate Alignment Alternative consists of two reaches totaling 64,000 linear feet. As shown in **Figure 2-3**, the northern reach would begin at the Jennings Plant Pump Station located at Modesto's Jennings Plant and would extend west and cross under the San Joaquin River then along Lemon Avenue

and Zacharias Road to the DMC, as described above for Segment 2 of Alternative 1. The southern reach would originate at a new pumping facility at the western end of the Harding Drain Bypass Pipeline near the San Joaquin River outfall location and would cross under the river and extend west to the DMC via open space, Pomegranate Avenue, and agricultural lands (primarily along West Marshall Road). **Table 2-2** shows the two pipeline reaches and their characteristics. Pipelines in both reaches would be 42 inches in diameter. Pumping facilities are described below.

The northern reach from the Jennings Plant would cross a total of five irrigation canals, four of which are owned by PID. The southern pipeline alignment would cross four parallel PID lined and unlined irrigation canals. Similar to Alternative 1, construction would take approximately 21 months, starting in the fall of 2016.

Table 2-2: Alternative 2 - Separate Alignment Alternative - Reach Characteristics

Segment	Approximate Length (feet)	Pipe size (inches)	Special Construction Considerations
Northern Reach – Modesto's Jennings Wastewater Treatment Plant to DMC			
Same as that described under Segment 1 for Alternative 1	32,000	42	Same as that described under Segment 1 for Alternative 1
Southern Reach - Harding Drain Bypass Pipeline to DMC			
Open Space (including San Joaquin River and floodplain) between Harding Drain Bypass Pipeline and Pomegranate Avenue	32,000	42	As with the northern reach, HDD or tunneling of the pipeline would be required to cross under San Joaquin River to avoid the waterway and wetland resources.
Pomegranate Avenue between San Joaquin River floodplain and Locust Avenue			Road closure anticipated along Pomegranate Avenue during construction, requiring detours. One segment of trenchless pipe would be required to cross both SR 33 and CFNR[1]. Trenchless method also may be needed to cross irrigation canals.
Private road between Locust Avenue and SR 33			
Parallel and north of West Marshall Road between SR 33 to DMC (up to 80 feet north of West Marshall Road)			
Total Length of two reaches	64,000		

Notes: The CFNR parallels SR 33 through much of the San Joaquin Valley, and spans the extent of the NVRRWP project bounds. The center line of SR 33 is approximately 75 feet away from the center line of the CFNR. Due to the proximity of the highway to the CFNR, it is assumed that a single trenchless pipe would be sized to span both crossings. The CFNR would require a protective casing for the pipe crossing under the railroad tracks.

2.3.2 Pump Stations-Separate and Combined Alignment Alternatives

For Alternative 1, flow from the Harding Drain Bypass Pipeline would be conveyed by gravity to a modified pump station at the Jennings Plant, where it would combine with flow from Modesto. Only the modified existing Jennings Plant outfall pump station described below would be required as part of the proposed project to convey combined flow to the DMC. **Figure 2-5** shows the conceptual modifications to the existing pump station. Details for the individual pump stations are shown in **Table 2-3**.

For Alternative 2, two pump stations would be required as part of the proposed project. For the northern reach of Alternative 2, the existing Jennings Plant outfall pump station located at the southwestern end of the Jennings Plant would be modified for pumping to the DMC by retrofitting new pumps, motors and electrical gear into the existing structure. For the southern reach of Alternative 2, a new pump station would be constructed near the western end of the Harding Drain Bypass Pipeline on land owned by the City of Turlock at the southwest corner of the intersection of South Carpenter Avenue and Harding Road. This proposed pump station would be above ground and would be enclosed. A conceptual plan and elevation for the new above-ground pump station at the Harding Drain Bypass Pipeline are shown in **Figure 2-6** and **Figure 2-7**, and the location is shown in **Figure 2-8**.

Table 2-3: Pump Station Characteristics (Preliminary)

Alternative / Pump Station	Horsepower (hp)	Flow Rate (cfs)	Dimensions (length x width)	Maximum Height (feet)
Alternative 1				
Modified Jennings Plant Pump Station	500	46	Pumps would be installed in existing pump station structure; approximately 20 feet x 30 feet	Pumps located outdoors on top of existing wet well; approximately 15 feet high above ground level
Alternative 2				
Modified Existing Jennings Plant Pump Station	300	23	Same as above	Same as above
Pump Station at Harding Drain Bypass Pipeline	250	23	Overall site dimensions 100 feet x 100 feet. Pump building footprint approximately 40 feet x 50 feet	Building height approximately 15 feet above ground level

The pump station buildings would be surrounded by pavement for access and a fence to ensure security. Automatic-sensor lights would also be installed to provide safety and security. Power to the new pump station at Harding Drain Bypass Pipeline is assumed to be furnished by the nearby electric grid system operated by the Turlock Irrigation District (TID). The existing TID power supply to the Jennings Plant pump station, consisting of above-grade wires mounted on poles is assumed to be used for the modified pump station. Alternative 1 is estimated to use 15,442 megawatt hours per year of electricity for pumping; Alternative 2 is projected to require 17,898 megawatt hours per year, and Alternative 3 would require 20,063 megawatt hours per year. Generators may be needed to provide emergency power in the event of a power outage.

Figure 2-5: Modifications to Jennings Plant Pump Station

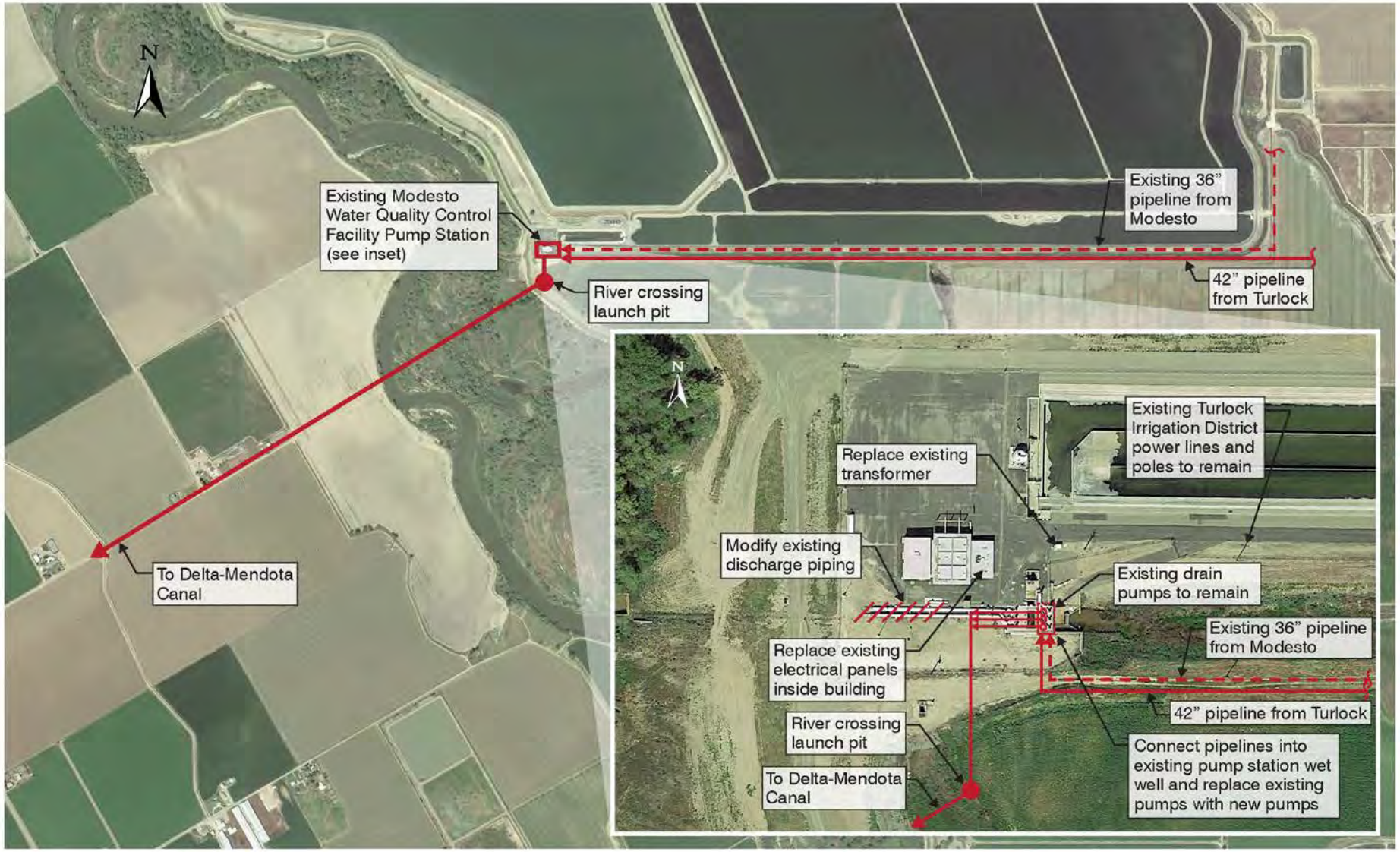


Figure 2-6: Site Plan for New Pump Station

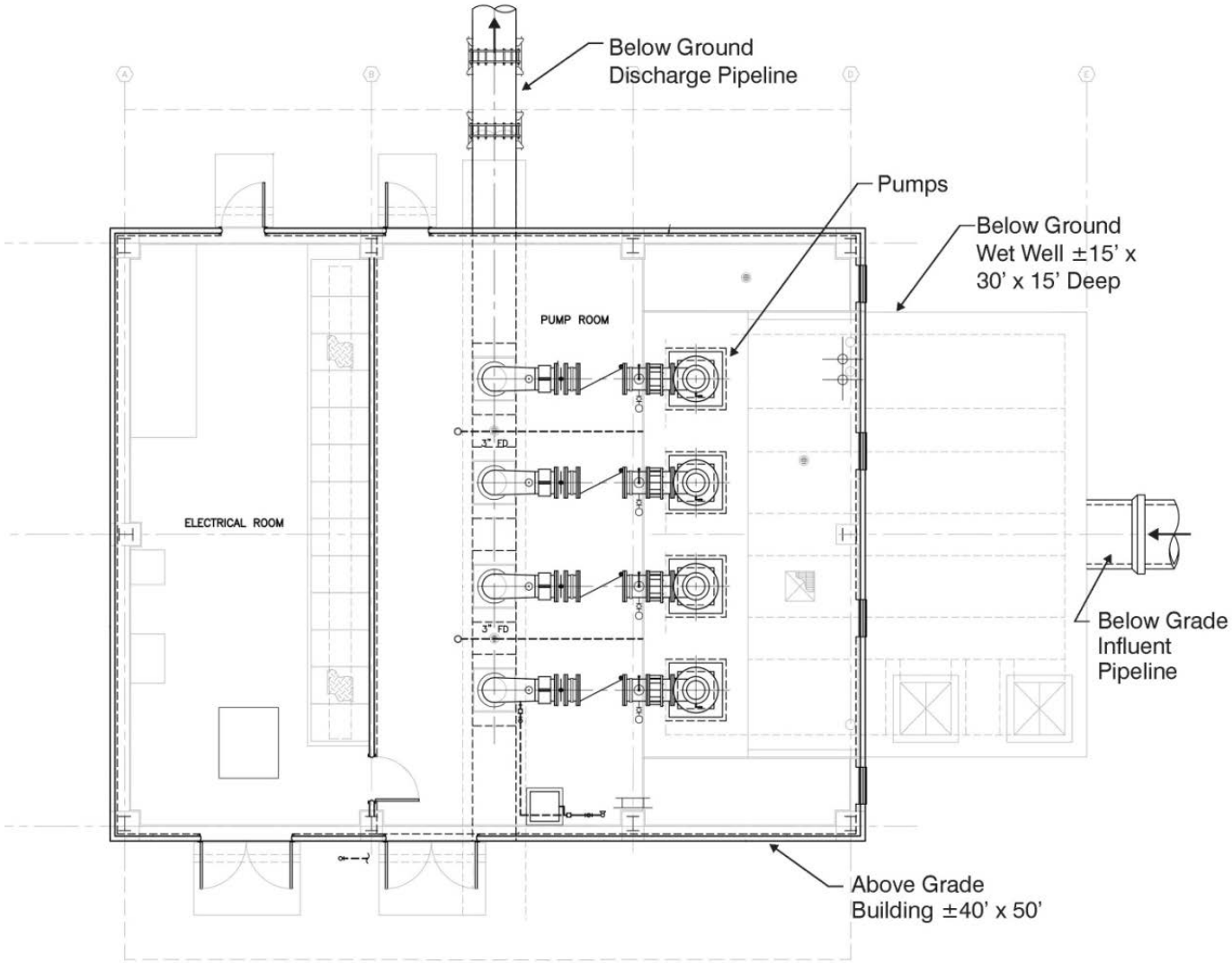


Figure 2-7: New Pump Station Elevation

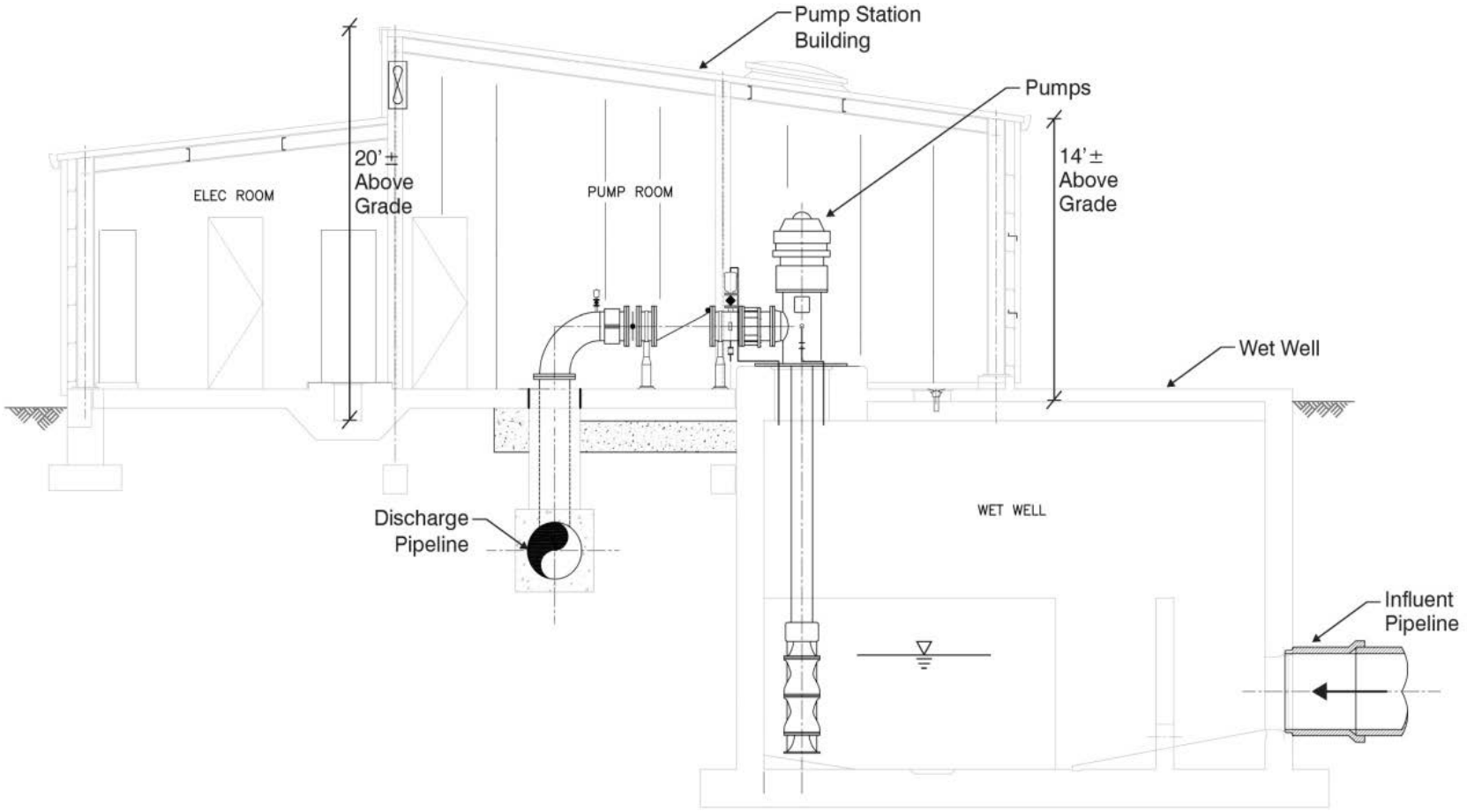
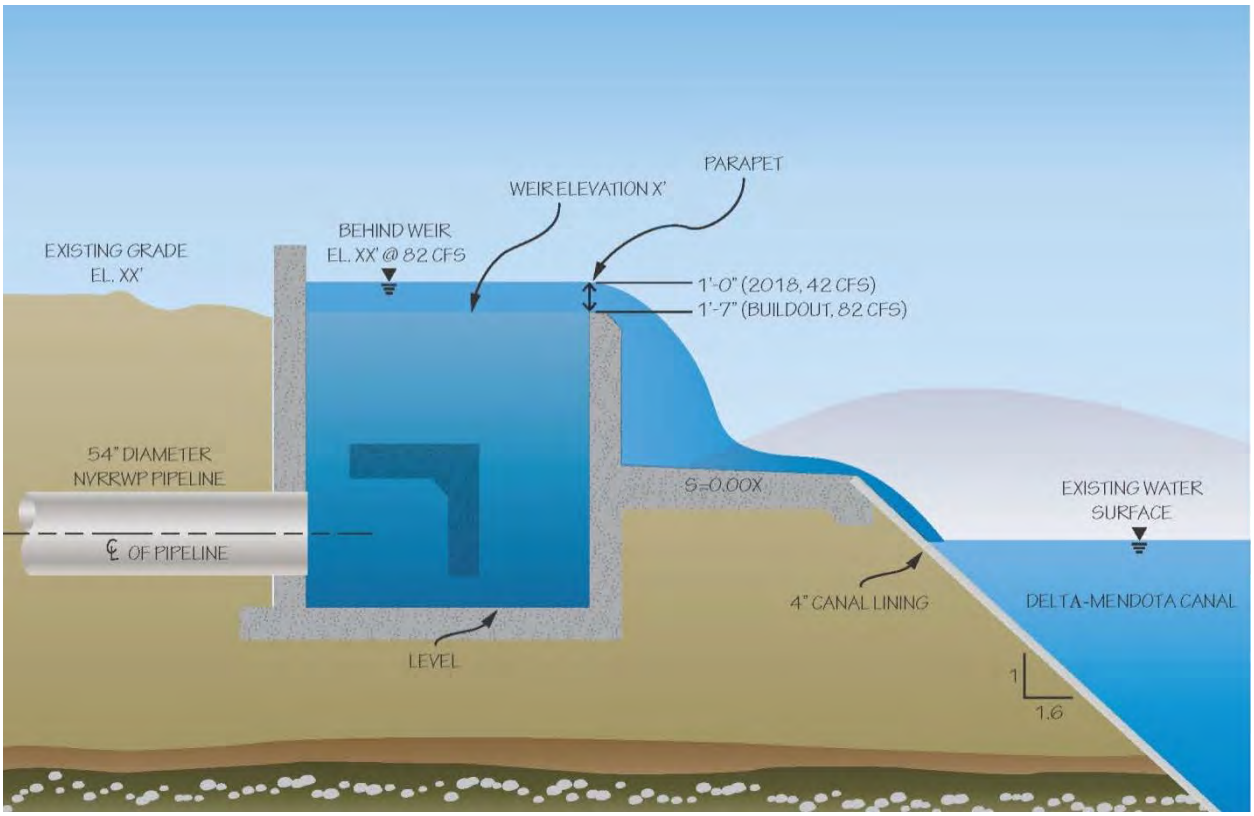


Figure 2-8: Location of New Pump Station at Harding Drain Bypass Pipeline

2.3.3 DMC Discharge Facility- Combined and Separate Alignment Alternatives

For both pipeline corridor alternatives water would be discharged to the DMC at an outfall facility located adjacent to the east bank of the existing DMC. The footprint of the facility would be approximately 30 feet by 50 feet, and would be enclosed with security fencing. The structure itself would consist of a reinforced concrete, open-ended rectangular box, situated below and above grade **(Figure 2-9)**. The box would contain a fixed-point, sharp-crested weir for hydraulic stability. Downstream of the weir, the water would flow over a concrete slab and into the DMC; this would be designed so as to require little to no modification or alteration of the existing DMC concrete lining. The facility would also include metering in a concrete vault structure and telemetry devices for communicating flow and water quality data and remote monitoring of the discharge facility.

Figure 2-9: Discharge Facility Section View



2.3.4 Conveyance Facilities-PID Conveyance Alternative

This alternative differs from the Combined Alignment Alternative and Separate Alignment Alternative (collectively referred to as pipeline corridor alternatives) in that water would be discharged to the San Joaquin River, which would function as a portion of the conveyance system. Water would then be diverted at the PID intake and conveyed partially through existing PID facilities and partially through an expanded PID system to the DMC.

An agreement with PID would be necessary to allow conveyance of water through their system. Because the existing canal is too small to convey all of the flows, in addition to conveying water through the canal, the PID conveyance system would have to be expanded, so that a portion of the flows would flow through a pipeline paralleling the Main Canal, and then discharged to the DMC. In addition, the PID Conveyance Alternative would have some operational constraints because PID routinely ceases operation of the Main Canal annually for 4 to 6 weeks for maintenance, specifically sediment removal. During that time period,

the main canal would not be available to convey recycled water, though flows through the new pipeline paralleling the canal would continue.

Under separate documentation, an interim transfer is being considered by the City of Turlock and DPWD which would be similar in description. As proposed, the transaction would entail transfer up to 13,400 AFY of water from Turlock to DPWD. The transfer would include 10,000 AFY of existing flows, which are currently discharged to the San Joaquin River, plus future flows up to a total of 13,400 AFY. The transfer would require appropriation of San Joaquin River flows under Section 1485 of the Water Code in an amount equal to quantities discharged by Turlock to the river, conveyance of the flows through the PID intake facility and Main Canal to the DMC, and conveyance of flows to DPWD turnouts along the DMC pursuant to a Warrant Act Contract with the U.S. Bureau of Reclamation. PID currently has sufficient capacity in the Main Canal to convey up to 13,400 AFY of existing Turlock flows to DPWD.

However, because the NVRRWP contemplates conveyance of up to 59,000 AFY of flows from both Turlock and Modesto, existing PID facilities would need to be expanded because there is insufficient capacity available to convey all of flows in the existing system. It is estimated that about 13,400 AFY of capacity could be made available in the Main Canal, though the ability to negotiate a long-term conveyance agreement with PID is uncertain. Assuming that 13,400 AFY of capacity would be available, it would be necessary to construct facilities to convey an additional 45,600 AFY from the San Joaquin River through the PID intake and to the DMC. Alternatively, the entire 59,000 AFY could be conveyed through a new pipeline paralleling the Main Canal. The environmental impacts of a slightly larger pipeline are not expected to be materially different than those for a pipeline that could convey 45,600 AFY.

PID Intake Expansion

The existing intake facility would have to be expanded by installing an additional 70 linear feet of structure containing about 48 additional linear feet of fish screen to divert the additional 45,600 AFY of NVRRWP buildout flow. The existing fish screen contains ten 12-foot-long bays for a total of 120 linear feet of fish screen; the expanded intake facility would have four additional bays. Construction of the additional fish screen bays would require work be conducted within the San Joaquin River. A cofferdam would be constructed and actual construction of the expanded intake would then take place within the cofferdam.

PID Pump Station

A new pump with 2,500 installed horsepower would be required to pump water through a new pipeline from the PID intake to the DMC. The pump would be sited at the existing PID intake facility, which is located on the west bank of the San Joaquin River at the end of Old Las Palmas Avenue. An emergency generator may also be installed to ensure capture of the available recycled water flows during times of power outages at the PID diversion facility.

PID Delivery System Expansion

From the expanded pump station, an additional 30,100 LF of 48-inch pipeline would be required to convey water to the DMC. The pipeline would parallel the northwest side of the Main Canal to the CFNR railroad and SR 33. Crossing of the railroad and SR 33 and is assumed to use a trenchless construction method. From SR 33 the pipeline would travel west on Bartch Avenue to Ward Avenue, where it would turn south and follow Ward Avenue to a discharge point at the DMC. The pipeline would cross five irrigation canals owned by PID; construction of these crossings would likely use some form of trenchless technology. The majority of the pipeline, other than the crossings described above, would be constructed using cut and cover construction.

Discharge from PID Conveyance System

Water would be discharged to the DMC through a discharge structure similar to those described for Alternatives 1 and 2. The structure would be a reinforced concrete, open-ended rectangular box containing a fixed-point, sharp-crested weir.

Future Treatment Plant Upgrades

This alternative could require the two cities to install future treatment plant upgrades if the RWQCB imposes additional requirements for removal of salinity and nutrients to protect cold water fisheries in the San Joaquin River. Such improvements could require installation of reverse osmosis, or similar technologies, for removal of salts. Installation of reverse osmosis or similar membrane technologies would also entail installation of brine management and disposal facilities.

2.4 Operation and Maintenance Requirements

2.4.1 Operations

Under the NVRRWP, the SOD CVP system would be used to convey and store recycled water, which is considered "non-project water" (i.e. non-CVP water. A long-term Warren Act Contract, which would include an operational exchange, would be needed with Reclamation. Once in the DMC, water could be diverted from any point along the DMC through existing turnouts to the DPWD service area and south of the Delta refuges or to the San Luis Reservoir for storage. Because both Cities' treatment plants operate 24 hours per day/365 days per year, the project would be operated year-round. Thus, the pump stations and pipelines would be operated 24 hours per day/365 days per year to deliver tertiary-treated water to the DMC. Non-project water conveyed in the DMC is on a "space-available" basis; availability of space is determined by Reclamation and is based on either the physical or "operational" constraints.

No changes to the District's internal, administrative water allocation system would occur. DPWD would work directly with Reclamation / San Luis & Delta-Mendota Water Authority (SLDMWA) to track water inputs and outputs into the DMC.

With respect to the SOD refuges, it is most likely water would be delivered to them during low agricultural-demand periods, although this has yet to be determined. Water would be delivered to the refuges via either existing turnouts from the DMC or through other existing private conveyance systems, as appropriate, and in accordance with the refuges' respective annual water delivery schedules. Water delivered to SOD refuges would be managed on refuge for wetland habitat purposes in accordance with the refuges' Reclamation approved Refuge Water Management Plans (available at: http://www.usbr.gov/mp/watershare/wcplans/index.html). No additional infrastructure would be required to serve water to refuges.

2.4.2 Maintenance

Maintenance of the project would primarily involve regular inspections of the pipelines and pump stations. The pipeline would be inspected as needed in any given year, and the pump stations would be inspected monthly. Existing Turlock and Modesto operations and maintenance staff would conduct maintenance activities. No vehicular trips would be needed for inspection of the pump station at Modesto's Jennings Wastewater Treatment Plant because it is located on the treatment plant site, where existing staff currently maintain its facilities. City of Turlock staff would drive to the pump station at the Harding Drain Bypass Pipeline for regular inspections. For the PID Conveyance pump station, arrangements for maintenance would need to be agreed upon with PID.

2.5 Construction Considerations

This section outlines the pipeline installation techniques under consideration for the NVRRWP. The precise construction methods are yet to be determined but work is anticipated to follow the broad methods outlined in the following sections.

All pipeline construction would occur within public roadways or other public ROW, private and municipal agricultural lands, and public open space areas (San Joaquin River and its floodplain). An easement from the California Department of Transportation (Caltrans) would be required to construct the pipeline underneath SR 33. An access agreement may be required for railroad crossings. Construction of the pipeline alignments would consist of open-cut construction, except at specific crossings (e.g., river, highway, railroad, and irrigation canals), where trenchless construction techniques would be employed.

Spoil (soil and rock) excavated during construction would be reused on site for backfilling or would be disposed of properly. Any material that would not be reused as backfill would be stabilized and stored temporarily at the construction staging area until characterized and then hauled away to a permitted disposal site. Potential for reuse of spoil from a trenchless installation would depend on the trenchless method selected because some methods remove spoil using slurry (i.e. the material is mixed with water or drilling fluid) and for those methods it is not practical to reuse excavated spoil.

2.5.1 Construction Timing

Construction is tentatively scheduled to last approximately 1.5 years, from the summer of 2016 to spring 2018. Typical project work hours would be Monday through Friday from 7:00 AM to 7:00 PM, but construction might take place during weekends and nighttime if necessary. The project construction contractor would be responsible for obtaining the necessary permits to conduct weekend and nighttime activities.

2.5.2 Staging Areas

Equipment, material and vehicle staging would be accommodated either at the construction zones, or at selected off-site locations (e.g., open lots) owned by the Cities. Staging areas could include:

- the area around the proposed discharge structure at the DMC;
- the area around the existing Jennings Plant Pump Station;
- the area around the site for the new pump station at the west end of the Harding Drain Bypass Pipeline; and
- the area of the existing PID intake facility.

2.5.3 Pipeline Construction

Open-cut construction

Open-cut construction (also referred to as open trench with shoring, or cut-and-cover) is the proposed option for installing the majority of the pipeline along existing roadways and private and municipal agricultural lands. The open-cut trench would range from 6 to 8 feet wide and approximately 8 to 10 feet deep, depending on the pipe size, existing utility locations, and pipe bedding requirements. Shoring would be required to provide trench stability. Open-cut construction would involve cutting, removing, and replacing pavement in existing paved areas. Where possible, the pipelines would be installed along the shoulder of the roads to minimize paving and traffic disruption.

To accommodate construction equipment and work area, the entire construction corridor (active work area including the trench) would be approximately 45 feet wide. Because of the limited width of the existing roads (especially Lemon Avenue, Zacharias Road, Pomegranate Avenue, and Jennings Road) and the size of the trench and construction zone, it is expected that the construction may require full road

closures unless temporary access for construction equipment can be provided along the shoulders of the road and/or adjacent property. If access can be provided along the roadway shoulders and adjacent property, only partial road closures with appropriate traffic control would be required. Otherwise segments of the affected roadway would be closed during pipeline installation activities and work would likely need to be conducted during late night/early morning hours to minimize traffic disruptions. Traffic control operations will be noticed at the location of the temporary traffic restrictions a week in advance of the any road work that impedes the flow of traffic (i.e. closes the road, closes a traffic lane, or closes the road shoulder).

It is expected that open trench construction within paved roadways would proceed at the rate of 200 to 500 feet per day within rural areas. Excavated trench materials would be sidecast within approved work areas and reused as appropriate for backfill. Upon completion of pipeline installation, affected roadways would be repaved per the requirements of Stanislaus County.

Open-cut construction would also be used within farmland. Some of the lands are fallowed while others are cultivated. Open-cut construction proposed for cultivated areas may require removal of the crop, depending on the crop and time of year. Temporary and permanent easements would be obtained from individual growers as needed.

Open-cut construction would not be used to cross the San Joaquin River, which would be crossed using trenchless construction, as described below. As shown in **Figure 2-5**, open-cut construction would be used within the Jennings Plant up to the point where trenchless construction would begin at a river crossing launch pit approximately 1,260 feet east of the river. Open-cut construction also would be used for the pipeline on the west side of the river, beginning at the receiving pit for the trenchless crossing. The exact location of the receiving pit has not been determined, but would be at least 250 feet from the west side of the river. Both the Combined Alignment and Separate Alignment Alternatives would include a river crossing at the Jennings Plant Pump Station. The Separate Alignment Alternative would also require a second river crossing at the new pump station located at the end of the Harding Drain Bypass Pipeline. At that location, open cut construction would proceed up to the river crossing launch pit, which is shown in **Figure 2-8**. The launch pit would be about 250 feet east of the river, and open-cut construction would also be used to construct the pipeline to the DMC from the receiving pit, which is located about 1,300 feet west of the river.

Trenchless Pipeline Construction

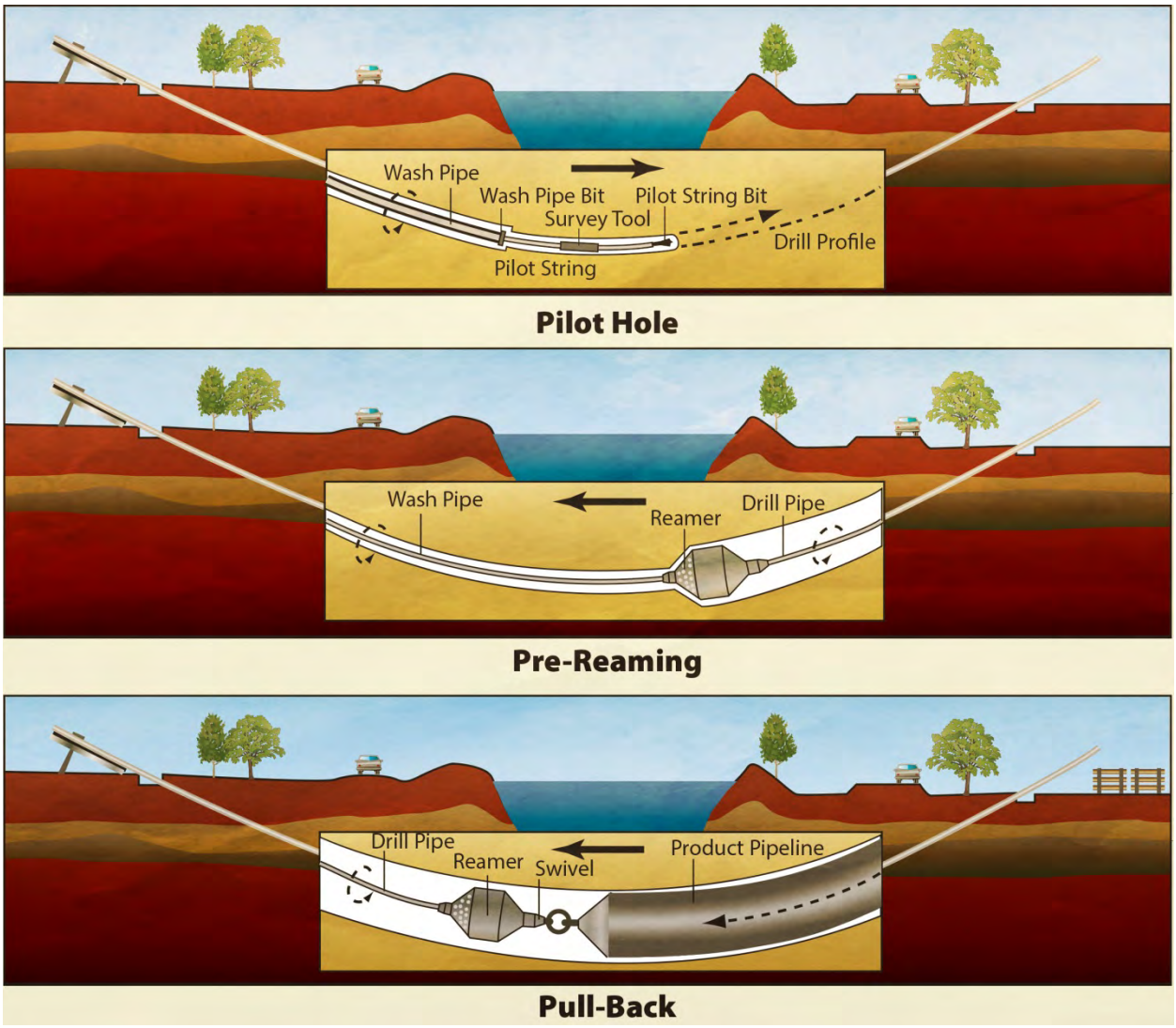
Trenchless construction methods would be used for specific crossings. These methods are used to minimize the area of surface disruption required for pipeline installation or where open-cut construction is not practical or not allowed. Horizontal directional drilling (HDD) would likely be used for crossing of SR 33 and the CFNR railroad, provided that a suitable geometric profile can be designed taking into consideration entry/exit angles, bend radius of the pipe, and sufficient room for pipe assembly and laydown. Otherwise, a pipe jacking methodology would be considered for those installations. The San Joaquin River crossing may be completed using microtunneling or HDD, depending on soil conditions and other design factors. For the San Joaquin River crossing, the launching and receiving pits would be located on either side of the waterway, outside the river levees and floodplains. The exact types of trenchless methods to be employed at irrigation canal crossings have not yet been determined, but could consist of HDD, jacking and boring, and/or microtunneling.

Horizontal Directional Drilling

HDD is a trenchless pipeline installation method that can be used for crossing major roadway intersections and waterways. HDD crossings are installed between an entry (launch) and exit (receiving) pit (see **Figure 2-10**). HDD involves the use of a drill rig tilted at the top at an angle, typically in the range of 10 to 15 degrees from horizontal. A small diameter (4 to 8 inch diameter) pilot hole is first drilled along a pre-determined horizontal and vertical alignment from the entry pit to the exit pit. This

pilot hole can be guided using electromagnetic readings transmitted from the drill bit back to the drill rig. Excavation takes place by introducing pressurized slurry (a thin mixture of water and clay) through a drill string to the bit. The slurry pressure in combination with a rotating drill bit excavates the material, which is then transported back to the entry pit along the outside of the drill string. In some cases, a larger diameter wash pipe may be rotated around the drill string to prevent sticking of the steerable string.

Figure 2-10: Diagram of Horizontal Directional Drilling (HDD) Process



Entry and exit pits are required at each side of the crossing. The pits are approximately 50 to 100 feet square by approximately 5 feet deep, and are used as the collection point for the fluid material removed during drilling, which is a mixture of the drilling slurry and spoil. This fluid is then pumped to a slurry separation plant to separate the spoil from the fluid so that the fluid can be reused. The pilot hole is then enlarged by pulling larger reamers (see **Figure 2-10**) from the pilot exit pit back towards the drilling rig. The pipeline is then pulled into place behind the last reamer.

The entry side requires a work area of approximately 1,500 to 3,000 square feet for the drill rig, slurry separation plant, material storage and other support equipment. The exit side requires a work area of about 1,000 to 1,500 square feet for the pullback. This area is exclusive of the area needed for the pipe

assembly and laydown area. Typically, a corridor about 15 feet wide by the length of the pipe is needed for the buildup and laydown.

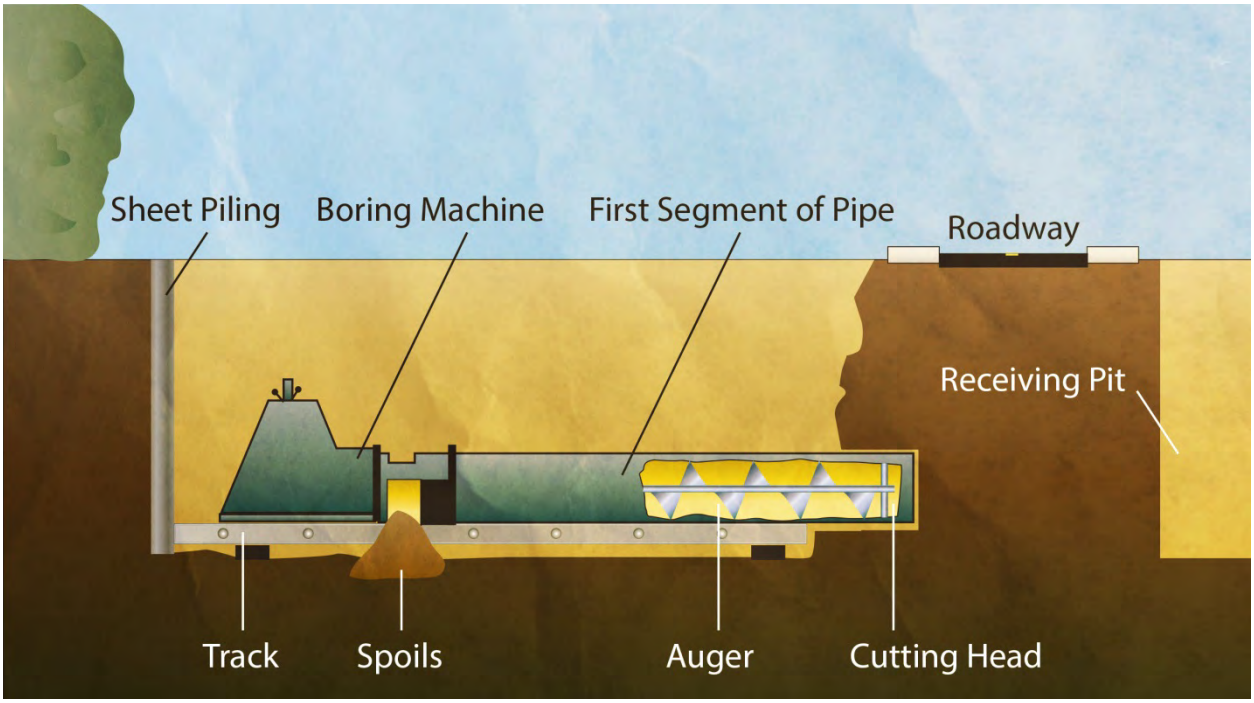
Pipes would be installed at varying depths depending on features being avoided, the existing underlying utilities, soil types, environmental constraints, entry and exit constraints, and bend radius of the installed product and drill pipe. Although the exact depths of the pits and drilling have not been defined as design has not yet been initiated, for the purpose of this analysis, it is assumed that the depth of construction would vary from 30 to 50 feet under the San Joaquin River bed and 10 to 15 feet under the highway/railroad/canals.

Pipeline installation using HDD at the San Joaquin River crossing would take about 8 to 10 months, and the SR 33/railroad crossing would take approximately 4 to 6 weeks to complete.

Jack and Bore Construction

Jack and bore is a method that is often used for major roadway intersections and railroad crossings where crossings are generally less than 300 feet long and above the ground water level. Jack and bore would require two pits that are excavated at each end of the pipeline to be installed (see **Figure 2-11**). A boring machine is inserted into one pit to bore the soil using an auger to remove material. As material is removed a casing is pushed forward until it reaches the receiving pit. After the casing is installed, the pipe is inserted in the casing. The jacking pit is excavated (and shored) with typical dimensions of 8 to 12 feet wide and 25 to 35 feet long depending on the casing length selected. The depth would depend on the feature to be avoided, existing utilities, or separation requirements. The exact depths of the pits and drilling have not been defined because design has not yet been initiated; however, for the purpose of this analysis, it is assumed that the depth of construction would be on the order of 15 to 20 feet deep for canal, railroad and highway crossings. Jack and bore typically has very limited steering control and it is not the method of choice if precise line and grade control is required. Jack and bore is not feasible for the San Joaquin River crossing.

Figure 2-11: Diagram of Jack and Bore Process

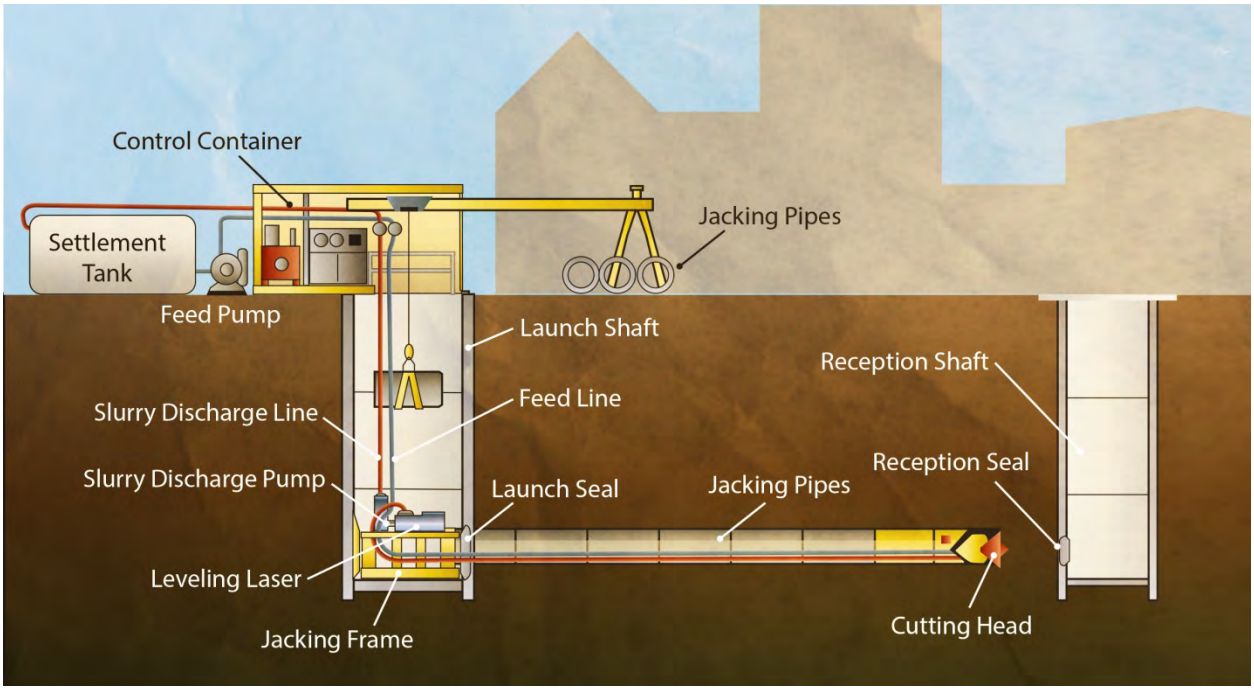


Shoring, appropriate to the pit depth, would be used to support the excavation. In addition, the back wall of the jacking pit would need to be constructed so as to withstand the reactive forces from the jacking frame. An additional area of about 1,500 to 2,000 square feet would be needed around the pit for temporary storage of pipe sections and for loading material removed from the bore. The receiving pit at the other end of the crossing would be smaller, encompassing approximately 100 square feet. Pits and work areas would be located within existing ROW and along streets, where appropriate. Crossings of roadways would typically take three to five days. After pipeline construction and installation is complete, the work area would be restored to preconstruction conditions.

Microtunneling Construction

Microtunneling is a remotely-controlled pipe jacking process that can be used in saturated areas below the groundwater level. The microtunneling boring machine is advanced through the ground by incrementally adding jacking pipe segments to the end of the pipe string and advancing the pipe string from a jacking pit to a receiving pit on the opposite side of the crossing (see **Figure 2-12**). A cutting head excavates material at the face as the machine is jacked forward. The excavated material is mixed with clean slurry and pumped to the surface for separation and muck removal.

Figure 2-12: Diagram of Microtunneling Process



Jacking pits for microtunneling are typically 10 to 14 feet wide. The length is dictated by the pipe segment length that would be installed. Ten-foot segments require a pit about 15 feet long and 20-foot pipe segments require a pit about 25 feet long. Receiving pits are typically 12 to 16 feet square. Pit depths would vary depending on the feature being avoided, existing utilities, and the presence of soil layers that are more favorable to tunnel through than others. The exact depths of the pits and drilling have not been defined because design has not yet been initiated. For the purpose of this analysis, it is assumed that the depth of construction would be approximately 15 to 25 feet under the river channel. A microtunnel operation requires a work area (including the area of the pit) of approximately 2,000 to 3,000 square feet at the jacking pit. The work area at the receiving pit can be smaller, but is typically a minimum of 1,000 square feet. Off-site staging areas can be used to reduce work areas.

Pipeline installation using microtunneling at the San Joaquin River crossing would take about 10 months, and the SR 33/railroad crossing would take approximately 4 to 6 weeks to complete.

2.5.4 Pump Station Construction

Modifications to the existing outfall pump station at Modesto's Jennings Plant would require removal and replacement of the three existing outdoor pumps and motors, and a power transformer within the same footprint. The new pumps would be larger than existing pumps, requiring the existing openings in the top slab of the pump station to be enlarged. The existing switchgear and motor control center housed in the existing control building would need to be replaced with higher capacity equipment to accommodate the new pumps. Equipment would be accommodated adjacent to the project site during construction. The construction zone, including the footprint of the pump station, would be 50 by 50 feet, mainly for storage of equipment. Minimal excavation would be required.

The new pump station at the Harding Drain Bypass Pipeline outfall site in Alternative 2 would require site preparation (e.g., removal of vegetation, if any), cutting the pavement if required, excavation and shoring, and placement of the structure. After the structure has been constructed, electrical equipment (e.g., motor control cabinets, panels, switchboards, lighting) would be installed and other installations (e.g., conduits and cables) would occur. Finally, installation of pavement and fencing, restoration of the work site, and testing would be conducted prior to the start of operations. Equipment would be accommodated adjacent to the project site during construction. The construction zone, including the footprint of the pump station, would be approximately 250 feet x 200 feet to provide clearance for excavation, storage of construction materials, and equipment access.

Construction of a new pump station for the PID Conveyance Alternative would follow procedures similar to those described for the pump station at the Harding Drain Bypass Pipeline outfall site.

2.5.5 Construction Equipment, Crew, Spoil and Trip Generation

Construction Equipment and Crew Size

The installation of the proposed facilities would require, but is not limited to, the following equipment: excavator, backhoe, front-end loaders, pavement saw, dump trucks, diesel generator, water tank, water truck, flat-bed truck, drill rig, compactors, double transfer trucks for soil hauling, concrete trucks, dewatering equipment and paving equipment. Following are descriptions of typical construction operations for the proposed pipelines and pump stations.

Pipeline Installation

Prior to the start of excavation, asphalt would be cut where needed for the new pipe trench using large saw blades mounted on a special cart that would be pushed by a construction laborer. The asphalt would be lifted in large chunks and slabs from the cut area by a front-end loader or backhoe into a dump truck for off-hauling. The saw cutting operation would be relatively fast, with several hundred feet typically being cut within a few hours. Installation of dewatering wells may be required prior to start of excavation depending on the soil type and groundwater level. Water pumped from the excavation area must be properly disposed to nearby irrigation ditches or impoundments. Dewatering pumps would run continuously (24 hours per day) in the open trench areas while excavation is taking place, to maintain the groundwater level below the bottom of trench. After the pipeline is installed and backfilled, the dewatering pumps would be removed and relocated to the next segment of pipeline construction. Heavy equipment for excavation would follow, which typically involves continuous use of an excavator to fill dump trucks which would make intermittent trips to an off-site disposal area. Typically two or more dump trucks would be used to allow continuous offloading from the excavator. In addition, dump trucks hauling material from off-site sources for pipeline bedding and backfill would make semi-continuous trips to the site as pipe is being installed. A front-end loader would be used to lift pipe segments from a flat-bed delivery truck and position the pipe in the trench. Temporary trench plates and paving would be

installed over the trench at the end of each work day. Final paving and marking typically would be done for the entire pipeline length after installation.

Trenchless pipe installation is described above and typically would involves use of a drill rig (for HDD) or jacking machine for 8 hours per day with associated mud collection pumps running simultaneously. It is assumed that two crews of up to 10 workers would be installing the pipelines at any one time.

Pump Stations

Construction of the proposed new Harding Drain Bypass Pipeline pump station or expansion of the PID Conveyance pump station would begin with site grading followed by excavation for below-ground utilities, foundation, and the wet well. Dewatering equipment would likely be required to maintain the groundwater level below the bottom of excavation. An excavator and dump trucks would be required during this phase of work, similar to pipeline construction. The excavation for this project would be relatively fast, likely less than one week. Below-ground concrete structures would be poured including the wet well and footings, followed by installation of the slab on grade. The building would be constructed on top of the slab, followed by installation of the pumps, electrical gear, controls, power supply, and ancillary systems.

Modification of the existing Jennings Plant outfall pump station would involve only minor excavation for new power conduits and piping. Existing pumps would be removed from the structure using a boom truck or small crane. The pump cut-outs in the existing above-ground wet well slab would be enlarged using a concrete saw. New electrical gear would be installed inside the existing control building, and a new power transformer installed in the existing transformer location. Minor grading and concrete work may be needed for a new spill containment structure for the transformer. The new pumps would then be installed in the enlarged cutouts of the existing pump locations. Much of the existing pump discharge piping would likely be re-used, pending a condition assessment.

One crew of approximately five members would construct the pump stations, which would be done in sequence.

Construction Spoil and Trip Generation

The amount of spoil generated would depend on the construction methods selected. **Table 2-4** shows estimated cubic yards (CY) of spoil from pipeline construction for each alternative.

Table 2-4: Spoil Generated by Pipeline Construction

Alternative/Facility	Spoil Quantity (CY)
Alternative 1-Combined Alignment	
Open trench construction	155,000
Trenchless construction at river	3,500
Alternative 2-Separate Alignment	
Open trench construction	150,000
Trenchless construction at river	3,700
Alternative 3-PID Conveyance	
Open trench construction	54,000

On a per day basis, assuming an average of 350 feet of pipeline would be constructed per day (200 days of construction) for Alternative 1, a maximum of 775 CY of material would be generated. This is equivalent to approximately 39 truck trips (20 CY haul, round trips) per day. For Alternative 2, the installation rate for the smaller pipe would be slightly faster. Assuming 400 feet per day (160 days of construction), the daily generation would be approximately 470 CY, resulting in approximately 23 truck trips. For Alternative 3, assuming 400 feet per day for 76 days of construction, up to 710 cubic yards

could be generated per day, requiring 36 truck trips per day. In addition, a maximum of 26 truck trips (round trips) per day would be required for all three alternatives for delivery of imported backfill, pipe, equipment and other materials. For the new pump stations, the spoil generated from the wet well excavation would be approximately 600 CY, resulting in approximately 30 truck trips.

In addition to equipment and material delivery, a total of 8 worker trips (round trip) would be generated per day assuming each individual drives separately and half of the workers travel for lunch.

2.5.6 Construction-Related Water Requirements

Water from water trucks would be used during construction activities for dust control purposes. Water generated from the trench dewatering operations may also be usable for dust control.

2.5.7 Environmental Commitments

Mitigation measures are described in *Chapter 3, Affected Environment/Environmental Setting, Environmental Consequences/Impacts and Mitigation Measures*, and address potentially significant impacts for each resource area. As required by CEQA, the Project Partners will adopt a Mitigation Monitoring and Reporting Program (MMRP), which would specify the mechanisms by which implementation of mitigation measures would be ensured during construction and operation of the NVRRWP. The MMRP would specify the environmental commitments that would be adopted as conditions of project approval.

2.6 Alternative Development Process

Five alternatives were considered during the preparation of the Feasibility Study (RMC 2013). Each of the five alternatives was evaluated against the following criteria to determine the alternatives to carry forward for further analysis:

- Technical feasibility
- Need for treatment plant upgrades
- Recycled water delivery
- Ability to deliver water to the entire District
- Cost effectiveness
- Institutional issues and obstacles

The Feasibility Study recommended implementation of a project that provides pipeline conveyance of recycled water directly to the DMC. This EIR/EIS evaluates two alignment options: Alternative 1, the Combined Alignment Alternative and Alternative 2, the Separate Alignment Alternative. In addition, an option that uses the San Joaquin River to convey water to an existing diversion facility is evaluated: Alternative 3, the PID Conveyance Alternative. A No Project/No Action Alternative is also evaluated, and assumptions regarding this alternative are described below.

Alternatives that were evaluated in the Feasibility Study but rejected from further consideration are discussed following the description of the No Project/No Action Alternative.

2.6.1 No Project/No Action Alternative

CEQA requires the evaluation of a No Project Alternative and NEPA requires analysis of a similar No Action Alternative. For the sake of this document, the No Project/No Action Alternative has been included to satisfy the requirements of both statutes and can be considered the existing conditions of the environment in the early 2014 when the Notice of Intent was published. For that reason, the No Project Alternative assumes no long-term, sustainable recycled water supply would be available to meet demands within the District or the refuges. The District would continue to rely on the CVP as its primary water

supply. To offset reductions in CVP allocations, the District would continue to execute water transfers / exchanges and to pump groundwater from private wells.

In 2014, the CVP allocation to DPWD was 0%, which resulted in the fallowing of over 11,000 acres of prime farm land, resulting in economic losses and loss of permanent crops, and placing even greater pressure on groundwater resources. The availability of water for transfers may decline over time, continuing the shortfall, and potentially further increasing pressure on groundwater resources through increased pumping. Groundwater pumping could ultimately lead to overdraft of the basin and other undesired associated effects, including subsidence and water quality degradation.

For the refuges, water would be unavailable wildlife management. Furthermore, Reclamation would continue competing for and purchasing supplemental water for SOD refuges on the open water acquisition/transfer market, which is increasingly becoming unreliable, unsustainable, and costly.

If recycled water is not conveyed, the DMC would continue operations in a fashion similar to existing conditions. Under the No Project Alternative, it is expected that operation of the DMC would continue unchanged.

If recycled water is not provided to DPWD, the Cities of Modesto and Turlock would continue their existing discharges to the San Joaquin River at their present levels. The Cities would not be obligated to discharge future, additional amounts of water to the San Joaquin River. The Cities could pursue other options for disposition of these future, additional amounts of water. If discharge to the river is continued, it is anticipated that both the Modesto and Turlock treatment plants would have to be upgraded in the future to meet increasingly stringent discharge regulations for cold-water fisheries. Even though the City of Modesto is upgrading to BNR/tertiary treatment, future discharge regulations could further increase treatment requirements. The Central Valley Regional Water Quality Control Board (CVRWQCB) has indicated that stricter limitation on discharge to the river will be imposed in the future, which are driven, in part, by requirements for protection of anadromous fish. This could require construction of reverse osmosis or other expensive treatment processes.

The City of Turlock would also likely need to upgrade treatment processes, possibly including new ultraviolet (UV) disinfection and nitrogen removal processes. Their existing facility provides ammonia removal to meet discharge permit requirements; however unlike the Modesto facility, the Turlock facility does not remove nitrates/nitrites from the effluent. Nitrate/nitrite removal could potentially be required in the future for Turlock, as it is for Modesto, which would require construction of new treatment processes similar to Modesto's. In addition, Turlock faces the same potential future restrictions on river discharge, which could require costly treatment processes such as reverse osmosis.

2.6.2 Alternatives Considered but Rejected

The following alternatives were evaluated during the preparation of the Feasibility Study for the project and were determined either to be infeasible or did not adequately meet project objectives.

Pipeline Conveyance of Recycled Water Directly to DPWD and Refuges

Alternatives to serve various portions of the DPWD service area with recycled water pipelines direct to customers were investigated during the Feasibility Study. For ease of implementation and cost-effectiveness, service was limited to the DPWD customers east of the DMC (to avoid a pipeline crossing under the DMC) and to customers within approximately 10 miles of the Modesto Jennings Plant. The supply of recycled water to the refuges was considered by delivering recycled water to the Newman Wasteway; from there the recycled water would be delivered to a select number of refuges. Recycled water would only be available to the North Grasslands and China Island Units.

One concern with this alternative was the implication of direct discharges of recycled water into the refuges without the benefit of any dilution. Also, because customers would be served directly off of the

pipeline network, the lack of year-round demand may require seasonal storage of recycled water in existing and potential new storage ponds.. Recycled water is generated year-round, with quantities typically being higher in the rainy months when inflows to wastewater treatment facilities are higher. Demand for water supply for irrigation peaks in the summer months, and there is little demand in the winter. Therefore, maximizing reuse would require some mechanism to store recycled water during the winter for use during the irrigation season. Providing water to refuges would help to balance the seasonal supply and demand, because refuges need water during different time periods, with peak demand typically occurring in the fall, when irrigation demand is decreasing. However, this alternative would only serve two refuges, and their demand, is not expected to be sufficient to use all of the wintertime flows of recycled water that would be generated by Turlock and Modesto, especially in wet winters. Therefore, some type of additional seasonal storage would be needed to allow reuse of all of the recycled water that would be produced at buildout.

Similar to the Proposed Project, water rights would need to be established through approval of a Wastewater Change Petition, which would allow Modesto and Turlock to change the location of discharge and place of use for water that is currently discharged to the San Joaquin River.

The direct pipeline alternatives were determined to not meet project objectives, including maximizing use of recycled water for agriculture and the refuges, as it would only serve DPWD growers on the east side of the DMC, and only provide recycled water to two refuges.

Pipeline Conveyance of Recycled Water to Existing Facilities for Dilution and Conveyance in the DMC

An alternative to serve DPWD and the refuges by directly conveying water through a pipeline to the Patterson Irrigation District Main Canal for conveyance to the DMC was investigated during the Feasibility Study. This alternative is similar to the Proposed Project but reduces the overall length of pipeline that would be constructed by the NVRRWP by using the existing PID Main Canal for a portion of the conveyance distance. As such, this alternative would include a requirement for participation in PID's Proposed East-West Conveyance Project, which seeks to upgrade PID facilities using some combination of canal widening and construction of new pipeline. The combination of NVRRWP pipeline construction plus construction associated with the PID East-West Conveyance Project is expected to result in a similar degree of short-term environmental impacts.

Furthermore, PID routinely ceases operation of the Main Canal annually for 4 to 6 weeks for maintenance, specifically sediment removal. During this maintenance period, water from the Modesto and Turlock would have to be discharged to the San Joaquin River for disposal, and could not be retrieved from the Delta for beneficial use by DPWD or the refuges because the maintenance period would be outside of the July-September transfer window. Because the quantity of water being conveyed for PID customers' use varies, the ability to achieve adequate dilution for discharge within the Main Canal would be limited at times, thus subjecting PID customers who take water from PID facilities before it reaches the DMC to requirements of a water recycling program, including signage and separation from potable water wells.

Similar to the Proposed Project, water rights would need to be secured to change the location of discharge and place of use for Modesto and Turlock. Turlock and Modesto would need to secure the right to change the location from the San Joaquin River to the PID Main Canal through a Wastewater Change Petition.

Due to the complications from PID's operational constraints on the Main Canal and the impacts to PID customers, this alternative was rejected. The inability to deliver recycled water year-round was considered to be a fatal flaw because a substantial quantity of recycled water would not be available for beneficial use.

Pipeline Conveyance to DMC Utilizing Groundwater Storage and Operational Modifications

This alternative to serve DPWD and the refuges considers a combination of direct delivery to the DMC (during the months of April to June when the O'Neill Pumps at the head of the DMC are likely to be off) and groundwater recharge and recovery (year-round). During the rest of the year recycled water would be diluted with river water and percolated into the groundwater, where it would be stored for later recovery.

Conveyance of water to the DMC would be accomplished using the same pipeline system as the Proposed Project; additional pipelines would be needed to convey water to spreading basins. This alternative investigated the creation of spreading basins near PID's planned sedimentation basin, which is currently in the feasibility stage of design or near Orestimba Creek for groundwater recharge. This alternative would also require dilution water from the DMC and/or the San Joaquin River to meet blending requirements for recharge of Modesto and Turlock's water.

This alternative was structured as an option if there were restrictions to introducing Modesto and Turlock's water directly to the DMC. It has been determined that flows could be accepted year-round to the DMC, therefore the incorporation of groundwater storage is an unnecessary complication in project operations. Because it would require more pipelines plus the creation of new spreading basins this alternative has the potential for greater environmental impacts and would be operationally more complicated than the Proposed Project. Because of the complexity of incorporating groundwater storage, and potentially greater environmental impacts, this alternative was rejected from further consideration. It was also determined to be infeasible to coordinate and implement recycled water discharge to the DMC only when Reclamation's O'Neill Pumping Plant is non-operational.

San Joaquin River Conveyance of Recycled Water through San Joaquin-Sacramento River Delta to the DMC or O'Neill Forebay

This alternative to serve DPWD and the refuges by conveying recycled water through the San Joaquin River to the Delta and into the DMC or O'Neill Forebay via the C.W. Bill Jones or Harvey Banks Pumping Plants was considered but rejected for analysis in the Feasibility Study. Water loss from seepage and evaporation along the San Joaquin River (estimated at 10%) and carriage losses (which can be from 0-100%, with the average being 30%), combined with the limited July-September timeframe during which transferred supplies can be pumped through the pumping plants, would greatly reduce the quantity of recycled water from Modesto and Turlock that would be available to DPWD and the refuges. These losses would be in addition to the standard 5% loss imposed by a Warren Act Contract, which under all options analyzed will be required in order to utilize conveyance and/or storage in the Federal Facilities.

Unlike the Proposed Project, which would obtain water rights through a Wastewater Change Petition, water rights would need to be secured by Turlock and Modesto to allow for diversion of water. The process for obtaining a new water right for diversion from the San Joaquin-Sacramento River Delta to the DMC is expected to be more complex than the process for a Wastewater Change Petition, and it is also highly likely that a request for a water right from the Delta would be subject to protest. Turlock would secure their water right for recycled water currently discharged to the San Joaquin River. Modesto would need to secure the water right for the portion of their recycled water currently discharged to the San Joaquin River (during winter months) and the water right for the portion of their recycled water currently land applied (during summer months), which would now have to be discharged. With continued discharge to the river it is anticipated that both treatment plants would have to be upgraded in the future to provide partial treatment via reverse osmosis for salinity removal, which would be very costly. Additionally, unlike the Modesto Jennings Plant, the Turlock RWQCF does not remove nitrates/nitrites from the effluent. Nitrate/nitrite removal could potentially be required in the future under Turlock's NPDES Discharge Permit, as it is for Modesto's, which would require construction of new treatment process facilities.

Due to the potential need for future treatment plant upgrades, evaporative and carriage water losses in the San Joaquin River and the Delta, the limited window for pumping water transfers at the Jones or Banks Pumping Plants, and the complication of securing new water rights within the San Joaquin-Sacramento River Delta, this alternative was rejected. This alternative would provide far less recycled water to DPWD and the refuges, and it has thus been determined not to meet project objectives.

2.7 References

Bureau of Reclamation (Reclamation). 2012. Water Management web page available at: http://www.usbr.gov/mp/watershare/wcplans/index.html

Central Valley Regional Water Quality Control Board (CVRWQCB). 2011. The Water Quality Control Plan (Basin Plan) for the California Regional Water Quality Control Board, Central Valley Region , Fourth Edition, the Sacramento River Basin and the San Joaquin River Basin. Available at: http://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/sacsjr.pdf

RMC Water and Environment (RMC) 2013. North Valley Regional Recycled Water Program Feasibility Study, December 2013

State Water Resources Control Board (SWRCB). 2010. 2010 Integrated Report (Clean Water Act Section 303(d) List / 305(b) Report) – Statewide. Available at: http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml?wbid=CAR540000020021002100850

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Chapter 3 Affected Environment/Environmental Setting, Environmental Consequences/Impacts and Mitigation Measures

3.0 Introduction to Environmental Analysis

As noted in Chapter 1, Introduction, this environmental document is a joint EIR/EIS designed to meet the requirements of both the California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA).

3.0.1 Determination of Impact Significance

Although this document is a combined CEQA/NEPA document, significance determinations are made pursuant to CEQA. Under NEPA, once a decision is made regarding the need for an EIS, it is the magnitude of the impact that is evaluated and there is no judgment of its individual significance. NEPA does not require that a determination of significant impacts be stated in the environmental documents. CEQA, on the other hand, does require identification of each significant effect on the environment resulting from the project and ways to mitigate each significant effect. This chapter discusses the magnitude of environmental consequences pursuant to NEPA and discusses the impacts of the project and their CEQA significance.

3.0.2 CEQA/NEPA Terminology

CEQA and NEPA use different terms to describe the same concepts. CEQA terminology is used in this document, but all use of CEQA terms should be understood to be inclusive of the corresponding NEPA terminology. Equivalent terminology under NEPA and CEQA is shown below:

CEQA Terminology	Corresponding NEPA Terminology
Project/Proposed Project	Action/Proposed Action
Environmental Setting	Affected Environment
Environmental Impacts	Environmental Consequences

3.0.3 Organization of Discussion of Environmental Issue Areas

This Draft EIR/EIS provides analysis of impacts for environmental resources that could be affected by the North Valley Regional Recycled Water Program (NVRRWP). Sections 3.1 through 3.19 discuss the environmental impacts that may result with approval and implementation of the NVRRWP. Each environmental issue area that follows contains a description of:

1. The environmental setting as it relates to the specific resource topic;
2. The regulatory framework governing that issue;
3. The methodology used in identifying the issue(s);
4. The CEQA significance criteria;
5. An evaluation of impacts and identification of mitigation measures, if needed; impacts are presented for the following alternatives:
    - 1-Combined Alignment Alternative
    - 2-Separate Alignment Alternative

- 3-PID Conveyance Alternative
- No Action Alternative

6. A determination of the level of significance after mitigation measures are implemented.

3.0.4 Analysis of Cumulative Impacts

CEQA and NEPA Requirements

Both CEQA and NEPA require consideration of cumulative impacts. A cumulative impact is created as a result of the combination of the project evaluated in the EIR/EIS together with other projects causing related impacts. NEPA and the Council on Environmental Quality (CEQ) regulations require an assessment of cumulative impacts, in addition to the evaluation of direct impacts (40 C.F.R § 1508.7, 1508.25). CEQ regulations implementing NEPA define a cumulative impact as:

> "... the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."

Cumulative impacts, as defined in Section 15355 of the CEQA Guidelines, refer to two or more individual effects that, when considered together, are considerable or that compound or increase other environmental impacts. The cumulative impact from several projects is the change in the environment that results from the incremental impact of the project when added to other closely related past, present, or reasonably foreseeable future projects. Pertinent guidance for cumulative impact analysis is provided in Section 15130 of the CEQA Guidelines:

- An EIR shall discuss cumulative impacts of a project when the project's incremental effect is "cumulatively considerable" (i.e., the incremental effects of an individual project are considerable when viewed in connection with effects of past, current, and probable future projects, including those outside the control of the agency, if necessary).
- An EIR should not discuss impacts that do not result in part from the project evaluated in the EIR.
- The discussion of cumulative impacts shall reflect the severity of the impacts and their likelihood of occurrence, but the discussion need not be as detailed as it is for the effects attributable to the project alone.
- A project's contribution is less than cumulatively considerable, and thus not significant, if the project is required to implement or fund its fair share of a mitigation measure or measures designed to alleviate the cumulative impact.
- The focus of analysis should be on the cumulative impact to which the identified other projects contribute, rather than on attributes of the other projects that do not contribute to the cumulative impact.

The cumulative impact analysis for each individual resource topic is described at the end of each resource section in this Chapter.

Approach to Cumulative Analysis

For evaluation of cumulative impacts, this EIR/EIS uses a list-based approach, and evaluates the potential for past, present and probable future projects in the project area to result in cumulative impacts. Table 3.0-1 contains a list of projects under consideration in the project area, and identifies those projects that have a potential nexus with the NVRRWP (i.e. there is a possibility that the proposed project could

contribute to incremental effects on the same environmental resources). The list of projects in Table 3.0-1 was developed using information provided by Reclamation, the Project Partners, and Stanislaus County.

Table 3.0-1: List of Cumulative Projects for NVRRWP

Reclamation Projects in Delta-Mendota Canal				
Doc Type	Log #	Status	Description	Impact Nexus?
EA/FONSI	14-020	FONSI 7/30/2014	Warren Act Contract for Conveyance of Groundwater from 4-S/Smith Ranch to Del Puerto Water District	N
EA/FONSI	14-031	FONSI 8/4/2014	Temporary change in the selenium MCL from 2 PPB to up to 5 PPB for groundwater introduced into the upper portion of the DMC	N
CEC	14-023	FONSI 8/18/2014	License to Panoche Drainage District to Re-route Drainage Collected by the Firebaugh Sumps to the San Joaquin River Water Quality Improvement Project	N
EA/FONSI	14-021	Active	Five-year Warren Act Contracts for Banta-Carbona Irrigation District, Byron-Bethany Irrigation District, Patterson Irrigation District, and West Stanislaus Irrigation District	N
EA/FONSI	13-050	Active	Warren Act Contract for Conveyance from Turlock to Del Puerto Water District	N
EA/FONSI	12-060	Active	Exchange Contractors Los Banos Creek Diversion	N
EA/FONSI	14-034	Active	Mendota Pool Group Warren Act Agreement	N
EA/FONSI	14-033	Active	Two-Year Extension of the 10-Year Mendota Pool Group Exchange Program	N
EIS/EIR	12-009	Active	20-Year Extension of the Mendota Pool Group Exchange Program	N
EA/FONSI	12-061	FONSI 1/10/2013	10-Year Exchange and/or Warren Act Contracts for Conveyance of Groundwater in the Delta Mendota Canal DMC (DMC pump-in program)	N
EA/FONSI	10-051	FONSI 2/14/2011	Accelerated Water Transfers and Exchanges between Central Valley Project Contractors South of Delta Contractors Years 2011-2015	N
EA/FONSI	09-149	FONSI 2/7/2014	Long-term Contract with Byron-Bethany Irrigation District for Storage and Conveyance of Non-Project Water in the Delta Division and San Luis Unit (BBID, Tracy Hills Water Supply Project)	N
SEA	14-006	FONSI 3/6/2014	Banta-Carbona Warren Act Contract Increase of 5,500 AF	N
EA/FONSI	14-10-MP	FONSI 4/22/2014	Water Transfers for the San Luis & Delta-Mendota Water Authority in 2014	N
SEA	13-007	FONSI 5/23/2013	Supplementing the Accelerated Water Transfer Program EA for South-of-Delta Contractors to Include Water Acquisitions for Refuges	N
EA/FONSI	14-001	FONSI 5/5/2014	Firebaugh Canal Water District Transfer of up to 7,500 acre-feet of Central Valley Project Water to Panoche, San Luis, and Westlands Water Districts	N

EA/FONSI	13-059	FONSI 5/5/2014	Central California Irrigation District Transfer of up to 20,500 acre-feet of Central Valley Project Water to Del Puerto, Panoche, San Luis and Westlands Water Districts	N
EA/FONSI	13-014	FONSI 6/18/2013	Storage and Conveyance of Yuba Accord Water in Federal Facilities for South of Delta Central Valley Project Contractors	N
EA/FONSI	12-023	FONSI 6/29/2012	Annual Exchange at the Mendota Pool between the Bureau of Reclamation and Donald J. Peracchi for up to 3,600 acre-feet of Farmers Water District's Groundwater for Central Valley Project Water	N
EA/FONSI	11-013	FONSI 9/16/2013	Amendment to the Meyers Groundwater Banking Exchange Agreement	N
EA/FONSI	13-035	FONSI 9/17/2013	Merced Irrigation District Warren Act Transfer to Westlands Water District 15,000 AF	N
EA/FONSI	14-009	FONSI 6/24/14	Tranquility Irrigation District/San Luis Water District Mendota Pool Groundwater Exchange Program Contract Years 2014-2018	N
City of Turlock Projects				
Doc Type	Date	Status	Description/Location	Impact Nexus?
IS/MND	1/22/2014	Published	Monte Verde Subdivision, 2531 West Tuolumne Rd, Turlock - 109 single family lots	N
IS/MND	4/25/2014	Published	Traditions 6, Fitzpatrick homes, 2920 Sandstone St, Turlock - 15 single family homes	N
IS/MND	5/6/2014	Published	Taco Bell, 3606 N. Golden State Bv, Turlock - 2,106-square-foot fast food restaurant	N
IS/MND	6/23/2014	Published	Verizon Wireless Cell Tower, 2300 Industrial Rowe, Turlock - new cell tower	N
IS/MND	5/29/2014	In process	Dairy Processing Plant, 4407 W Main Street, Turlock - 116,287-square-foot industrial facility	N
TBD	NA	In planning	Turlock Engineering Division Capital Project, various water, wastewater projects - none in vicinity of NVRRWP	N
City of Modesto Projects				
Doc Type	Date	Status	Description/Location	Impact Nexus?
IS/MND	2010	under construction	Jennings Road Treatment Plant Phase 2 Improvements, 7007 Jennings Rd, Modesto - increase tertiary treatment capacity by 12.6 mgd	Y
EIR	2013	Published	Marketplace Shopping Center, Oakdale Rd/Sylvan Av, Modesto - 170,000-square-foot retail project	N
City of Patterson Project				
Doc Type	Date	Status	Description/Location	Impact Nexus?
EIR	2012	Approved	West Patterson Business Park Expansion Project	N

DPWD Project				
Doc Type	Date	Status	Description/Location	Impact Nexus?
Cat Ex	2014	In planning	Orestimba Creek Groundwater Banking Pilot Project	N
Stanislaus County Council of Governments (StanCOG) Project				
Doc Type	Date	Status	Description/Location	Impact Nexus?
TBD	2014	In planning	South County Corridor Study-potential route along West Main Street	Y
TBD	2014	In planning	State Route 33 widening/expressway from Sperry Avenue (downtown Patterson) north to Rogers Road	Y
Stanislaus County Projects				
Doc Type	Date	Status	Description/Location	Impact Nexus?
TBD	2014	In design, estimate construction in 2016	West Main Street Highway Improvement Project, from San Joaquin River to 0.8 mi. west of Carpenter Rd	Y
EIR	10/13/14	NOP issued	Crows Landing Industrial Business Park Project, Specific Plan and zoning change for 1,532-acre project site south of West Marshall Road.	N

Projects identified above as having no impact nexus with the NVRRWP are not considered in the cumulative analysis because they are not expected to have impacts that could combine with the project. This determination is based on one or both of the factors below:

- Projects are located outside of the area where the proposed project would be constructed and could thus not have impacts that would combine with effects of the proposed project.
- Project is of a type that would not produce impacts that could combine with the NVRRWP

Reclamation projects in the DMC would have a cumulative effect on the capacity of the canal, and potentially on water quality, both of which would be managed by Reclamation through operation of the DMC and would not be expected to result in environmental impacts.

City of Turlock projects include residential, commercial/industrial and water/wastewater projects that are not located in the vicinity of the NVRRWP facilities.

The City of Modesto is considering approval of a retail project, which would not be located near the NVRRWP. The Jennings Road Treatment Plant Phase 2 Improvements would improve treatment, and would provide recycled water for the NVRRWP.

The City of Patterson has approved the West Patterson Business Park Expansion Project, which is expected to be developed in multiple phases over 20 to 30 years. The business park area extends from just north of Sperry Road in Patterson, north to Zacharias Road. While development proposals in the first Phase could occur during the timeframe proposed for construction of the NVRRWP, the first phases are located in the southern portion of the site and the later phases that would include development along Zacharias Road are not projected to be developed until 2023 at the earliest. Because the timing would not

overlap, the development of the business park is not expected to result in cumulative construction-related impacts. Operational impacts would be of a type that are not expected to combine with effects of the NVRRWP to result in cumulative impacts.

The DPWD Orestimba Creek Groundwater Banking project could benefit groundwater resources, and would not be expected to affect the San Joaquin River or have construction impacts similar to the proposed project. The project could have a cumulative effect on the capacity of the DMC, which would be managed by Reclamation through operation of the DMC and would not be expected to result in environmental impacts.

StanCoG is considering two roadway projects that could overlap with the NVRRWP pipeline alignments. The NVRRWP pipeline alignment would cross SR 33 in the area where widening is proposed; both the Combined Alignment and Separate Alignment Alternatives would cross SR 33 in the vicinity of Lemon Avenue and Zacharias Road. The proposed project would use trenchless technology to cross SR33 and would be coordinated with the road widening project. The NVRRWP pipeline for the Combined Alignment Alternative also coincides with a portion of the potential route for the South County Corridor, which could be located along West Main Street.

Stanislaus County is also proposing improvements along West Main Street. Design of the NVRRWP pipeline would be coordinated with any proposed transportation projects along West Main Street.

The Crows Landing Industrial Business Park Project area is bounded by West Marshall Road on the north, Fink Road to the south, Bell Road to the east, and Davis Road to the west. The northern edge of the project area is thus adjacent to the southern reach of the Separate Alignment Alternative, which follows West Marshall Road. Stanislaus County envisions that the project would be developed in three 10-year phases. A portion of Phase 1 SR 33 Corridor development, which is scheduled for 2016 to 2025, could occur in the area along the south side of Marshall Road. Phase 2. SR 33 Corridor Buildout, which would include development of the remainder of the project area adjacent to Marshall Road, is not expected to be developed until 2026. Given the extended time period for development of Phase 1, and the relatively short time period for construction of the NVRRWP, it is expected that pipeline construction can be coordinated with Stanislaus County (through the encroachment permit process) so as to avoid cumulative impacts of construction on West Marshall Road. Operation of a buried pipeline in West Marshall Road would not be expected to have any impacts that would combine with operation of the business park.

3.1 Aesthetics

This section evaluates the potential aesthetic impacts associated with implementation of the proposed project. Aesthetic resources are defined as the visible natural and built landscape features that surround a project site. For the purpose of this analysis, the study area includes aesthetic resources in the vicinity of the facilities to be constructed or modified under the proposed project. Aesthetic resources in the vicinity of other pre-existing facilities and locations that may be served by the proposed project, including farms within DPWD's service area and Federal NWRs and state wildlife WAs, are not evaluated in detail due to the limited potential for adverse aesthetic effects in these areas (as described in detail in the Methodology for Analysis below). For further discussion of agricultural resources and conveyance infrastructure, see *Chapter 2, Alternatives and Proposed Project/Action* and *Section 3.2, Agriculture and Forestry Resources*. For discussion of the NWRs and WAs that could be served by the proposed project and related public viewing opportunities, see *Chapter 2* and *Section 3.15, Recreation*.

3.1.1 Environmental Setting/Affected Environment

The discussion below defines the terms used in the aesthetics evaluation and describes the visual conditions of the region and study area.

Definitions

Visual character, visual quality, and visual sensitivity are three terms used throughout this section. Visual character is the unique set of landscape features that combines to make a view, including native landforms, water, and vegetation patterns as well as built features such as buildings, roads, and other structures. Visual quality is the intrinsic appeal of a landscape or scene due to the combination of natural and built features in the landscape. Natural and built features combine to form unique perspectives with varying degrees of visual quality, which is rated in this analysis as high, moderate, or low. Visual sensitivity reflects the level of interest or concern that viewers and responsible land management agencies have for a particular visual resource with visual quality taken into account. Visual sensitivity is a measure of how noticeable proposed changes might be in a particular setting and is determined based on the distance from a viewer, the contrast of the proposed changes, and the duration that a particular view would be available to viewers. For example, areas such as scenic vistas, parks, trails, and scenic roadways typically have a high visual quality and visual sensitivity because these locales are publicly protected, appear natural, view durations are typically long, and close-up views are more commonly available.

Regional Setting

The terrain of the study area is generally flat, with the foothills of the Diablo Range rising to the southwest and the foothills of the Sierra Nevada rising to the east. The Coastal Ranges are visible from the valley floor from a distance; however, long-range visibility in the area is frequently limited by haze and particulate air quality contamination. The Sierra Nevada Mountains to the east are typically obscured or only partially visible. The valley floor is comprised of cultivated row crops, orchards, irrigated pasture, and canal systems. The San Joaquin River is the primary body of water in the study area and is the dominant natural feature in the area. Numerous riparian tree species and shrubs line the meandering river corridor. The vast system of drainage and irrigation canals also contributes to the region's sense of place.

Project Vicinity

The study area is generally located in the central portion of Stanislaus County to the north, east, and south of the City of Patterson. The Combined Alignment Alternative (Alternative 1) pipeline alignment begins near Turlock's Harding Drain Bypass Pipeline and continues north along South Carpenter Road, west on West Main Avenue, north on Jennings Road to the Jenning Plant, west beneath the San Joaquin River, and then along Lemon Avenue and Zacharias Avenue to the DMC. Land uses adjacent to the alignment and the pump station site consist of agriculture and rural residences.

The Separate Alignment Alternative (Alternative 2) includes two independent pipelines from each City's treatment facility to the DMC. The northern segment would be the same as the western portion of the Alternative 1 alignment (from the Jennings Plant to the DMC). The southern segment would begin from a new pump station located adjacent to the Harding Drain Bypass Pipeline, continue west underneath the San Joaquin River across open space and along Pomegranate Avenue, down a private road between Locust Avenue and Highway 33, continue along West Marshall Road and end at the DMC.

Land uses adjacent to both alignments consist of varied cultivated row crops, scattered residences, and open space. Typical public views of the study area are presented in **Figure 3.1-1**, which characterizes the area's agricultural and rural landscape. As shown in Photos 1, 2 and 3, open fields, overhead electrical utility lines, trees, and fencing, are typically seen from these roads. Motorists traveling on roads along and near the alignments have close-up and fleeting views of the project site. Residences located along the alignment including those along Zacharias Avenue and Lemon Avenue have direct views of the alignment. Given the openness and agricultural nature of the lands in the study area, the visual quality is considered moderate and the visual sensitivity is medium.

Since no public access to the Jennings effluent outfall pump station is available, no public views of the proposed modifications at this facility are available. The Alternative 2 pump station site is located near the western end of the Harding Drain Bypass Pipeline near South Carpenter Road. The site is vacant and consists of open space and agricultural land uses. A cascade aeration structure (associated with the Harding Drain Bypass Pipeline) and an industrial facility owned by Darling International are situated north of the Alternative 2 pump station site. Motorists using South Carpenter Avenue would have immediate views of the pump station site. Views of land uses in the vicinity of this particular pump station site consist of agricultural land, a drainage canal (shown in Photo 4), the cascade aeration structure and the nearby industrial facility. Given the rural and partially developed nature of lands in the immediate vicinity, the visual quality of the site is moderate and viewer sensitivity is medium.

3.1.2 Regulatory Framework

This section describes laws and regulations at the state and local level that may apply to the project. There are no federal aesthetics regulations that apply to the project.

State Policies and Regulations

California Scenic Highway Program

In 1963, the state legislature established the California Scenic Highway Program, a provision of the Streets and Highways Code, to preserve and enhance the natural beauty of California (Caltrans 2014). The State Highway System includes designated scenic highways and those that are eligible for designation as scenic highways.

Within San Joaquin, Stanislaus, and Merced counties, Interstate 5 (I-5) is considered an officially designated state scenic highway (between State Route 152 and State Route 205). There are two vista points along I-5 in Stanislaus County: one is located just south of Shiells Road Undercrossing and the other is approximately 0.5 mile south of Salado Creek. Neither of these vista points is in the immediate vicinity of the study area. Due to distance, no close-up views of the study area are available from I-5.

Local Policies and Regulations

Stanislaus County

Stanislaus County has identified the following goals and policies in the Conservation Element of the General Plan (1994):

GOAL ONE: Encourage the protection and preservation of natural and scenic areas throughout the County.

Policy One: Maintain the natural environment in areas dedicated as parks and open spaces.

Policy Two: Assure compatibility between natural areas and development.

City of Modesto

The City of Modesto's Urban General Plan does not include any policies relevant to scenic resources in the Project area. However, the General Plan envisions that the City of Modesto will preserve open space, farmland, scenic vistas, historic buildings, and sensitive environmental resources where feasible. The General Plan also envisions that in the long-term, the San Joaquin River floodplain and anticipated wetland preserves will separate urban expansions of the Freeway 99 corridor from those of the Freeway I-5 corridor (City of Modesto 2008).

3.1.3 Impact Analysis/Environmental Consequences

Methodology for Analysis

This section evaluates whether construction and operation of the facilities associated with the proposed project would result in significant impacts related to aesthetic resources. The visual analysis is based on evaluations of aerial and ground-based photographs of the project sites, and preliminary design information.

Visual effects were assessed based on the project's potential to substantially alter scenic resources or to degrade the visual character of the site. The evaluation of temporary or short-term visual impacts considers whether construction activities could substantially degrade the existing visual character or quality of the site or surrounding area, as well as the duration over which any such changes would occur. Because of their short-term nature, construction activities occurring in an area for less than one year are typically considered to have a less-than-significant effect on visual quality. However, construction activities occurring in an area for over one year have been evaluated for potentially significant visual impacts.

Actions with long-term visual effects, such as constructing new or altered structures, grading roads, removing trees, and introducing new sources of light and glare can permanently alter the landscape in a manner that could affect the existing visual character or quality of the area, depending on the perspective of the viewer. In determining impact potential, the assessment considers the visual sensitivity of the study area. Since damage to scenic resources such as trees, rock outcroppings, and other features of the built or natural environment would typically constitute a long-term effect, the potential for project implementation to damage scenic resources is evaluated solely as a long-term effect and is not included in the analysis of construction-related impacts.

Aesthetic resources in the vicinity of pre-existing facilities that would not be physically modified, and locations that may be served by the proposed project, including farms within DPWD's service area and Federal NWRs and state wildlife WAs, are evaluated in less detail due to the limited potential for adverse aesthetic effects in these areas.

Thresholds of Significance

Consistent with Appendix G of the *CEQA Guidelines* an impact on aesthetics would be considered significant if the project would:

- Have a substantial adverse effect on a scenic vista;
- Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway;
- Substantially degrade the existing visual character or quality of the site and its surroundings; or

- Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

Criteria Requiring No Further Evaluation

Criteria listed above that are not applicable to actions associated with the proposed project are identified below along with a supporting rationale as to why further consideration is unnecessary and a no-impact determination is appropriate.

- *Have a Substantial Adverse Effect on a Scenic Vista* – The proposed project facilities are not visible from any nearby scenic vistas, including the one located just south of Shiells Road Undercrossing and the other that is approximately 0.5 mile south of Salado Creek. Therefore, construction and operation of the proposed project would not have a substantial adverse effect on a scenic vista.

Impacts and Mitigation Measures

Impact AES-1 Substantial Damage to Scenic Resources and Substantial Degradation of Existing Visual Character or Quality

Combined Alignment Alternative

Construction Impacts. The Combined Alignment Alternative could result in temporary construction-related impacts on scenic resources and the visual character or quality of the study area and immediate vicinity. Due to the distance from I-5, construction of the Combined Alignment Alternative would not be visible from this scenic highway. Construction activities at the Jennings Plant would not be visible from any public viewpoints, as access to the plant is restricted to plant staff.

Pipeline construction activities associated with Alternative 1 would be mostly visible from public roadways including South Carpenter Road (from the Harding Bypass Pipeline to West Main Avenue), West Main Avenue, Jennings Road, Lemon Avenue, and Zacharias Road, as well as other roads intersecting the pipeline alignment. In general, pipeline construction activities would include vegetation removal, grading and excavation, open-trench pipeline installation for the majority of the alignment, trenchless pipeline installation at Highway 33 and the railroad crossing and San Joaquin River crossing, and backfilling. Open-cut pipeline construction would progress at a rate of 200 to 500 feet per day. It is anticipated that staging areas would be accommodated either within the construction zones or at selected off-site locations (e.g., lots) owned by the Cities, which would be used to store equipment, vehicles, pipe, and other construction materials for approximately 1.5 years throughout the construction duration.

Existing residences located along the pipeline alignment and motorists using the affected or nearby roadways would have foreground views of construction vehicles and equipment such as excavators, dump trucks, piping, front-end loaders, backhoes, and dewatering pumps. Motorists would have fleeting views of pipeline construction activities due to the speed of travel. For residences situated along the alignment (e.g., along Lemon Avenue and Zacharias Road), views of construction activities would generally be of short duration since construction equipment would move onto the next segment and areas affected by pipeline installation work would be restored to pre-construction conditions. In addition, as described in *Chapter 2, Section 2.5.7, Environmental Commitments,* the construction contractor would be required to keep the work areas clean. At the end of each work day, work areas would be cleaned up and trenches would be covered. Given the area's working rural landscape, the temporary nature of pipeline construction, and because the contractor would be required to clean up work areas on daily basis, construction-related impacts on scenic resources and the visual character of the study area would be less-than-significant.

Operation Impacts. Once constructed, the pipelines would be underground and would not be visible. Underground components would therefore have no impacts on scenic resources or the visual character of the area. As described in *Chapter 2*, *Alternatives and Proposed Project/Action,* air valves may be located

above ground and, if so, would be housed on a concrete slab in a protective steel cage approximately 4 feet x 4 feet in dimension on the shoulder of the road. While the steel cages would be visible to motorists passing by, these facilities would be relatively small and would not dominate views of the rural fields. Further, because these views would be fleeting, the aboveground air valves would not substantially degrade the visual character of the study area.

The existing pump station at the Jennings Plant outfall pump station would be repurposed within the existing footprint (approximately 20 feet by 30 feet). As shown in **Figure 2-4**, the new pumps would be housed within the existing pump station building that rises approximately 15 feet above ground. Because the modifications to the Jennings Plant pump station would not change the appearance of the existing facility and because no public views of the pump station are available, impacts on scenic resources and the visual character of the site and surrounding area would be less than significant.

Once operational, conveyance of water through existing facilities (e.g., the DMC) and use of water on farms in DPWD's service area would have no aesthetic impacts and conceivably even a beneficial effect on the agricultural lands' visual character because some lands may no longer be fallowed, deficit irrigated, or irrigated with poorer quality groundwater, and the impact would be less than significant.

Similarly, any water supplied to the south of Delta refuges directly via existing turnouts from the DMC or through water exchanges/transfers would enhance viewing opportunities and would result in a beneficial effect on the refuges' visual character and the impact would be less than significant.

Separate Alignment Alternative

Construction Impacts. Similar to Alternative 1, construction activities associated with Alternative 2 would mostly be visible from public roadways including Zacharias Avenue, Lemon Avenue, West Marshall Road, Pomegranate Avenue, and South Carpenter Road, and other roads that intersect the pipe alignment. Impacts associated with pipeline construction along the northern pipeline alignment would be the same as Alternative 1. Given that the visual character in the vicinity of the southern pipeline segment is also open and rural, construction-related impacts during pipeline installation would be similar to Alternative 1.

Construction activities associated with the new pump station near the western end of the Harding Drain Bypass Pipeline would be visible from South Carpenter Road (near its intersection with West Harding Road). Typical pump station construction activities involve site preparation, pavement cutting, excavation and shoring, placement of the pump station structure, paving, fencing, and restoration. Motorists traveling on South Carpenter Road would have close-up views of construction materials and equipment. However, due to the speed of travel, such views would be short in duration. Given the industrial and working nature of the adjacent Darling International facility, construction of the new pump station would not result in a substantial impact on the site's visual character and the impact would be less than significant.

Operation Impacts. Long-term impacts related to pipeline installation and delivery of water to farms and the refuges would be similar to Alternative 1 (see discussion above for details).

Regarding the new pump station, **Figure 2-6** in *Chapter 2, Alternatives and Proposed Project/Action,* presents a conceptual elevation view of the new facility. The building itself would be up to 20 feet tall and would house the new pumps on top of the wet well and discharge pipeline. The pump station building would be surrounded by paving for access and a fence for security purposes. Automatic-sensor lights would also be installed outside of the pump station building. The new facility would be visible from South Carpenter Road and would be built consistent with Stanislaus County General Plan policies. The facility would be smaller in scale than the adjacent industrial facility and would be consistent with the industrial and rural character of the surrounding area. As such, long-term impacts on scenic resources and the visual character of the area would be less than significant.

PID Conveyance Alternative

Construction Impacts. Similar to Alternatives 1 and 2, construction activities associated with the PID Conveyance Alternative would mostly be visible from public roadways, including Bartch Avenue and Ward Avenue and other roads that intersect the portion of the pipeline alignment that parallels the PID Main Canal. Given that the visual character in the vicinity of the pipeline alignment is also open and rural, construction-related impacts during pipeline installation would be similar to Alternatives 1 and 2.

Construction activities associated with the expanded intake facility and new pump at the existing PID intake site would be visible from the San Joaquin River and from the end of Old Las Palmas Avenue. Because this is a dead-end road with very little traffic, construction likely would not be visible to many observers. Typical construction activities involve site preparation, pavement cutting, excavation and shoring, placement of the pump station structure, paving, fencing, and restoration. Because the site already contains an intake facility, design and layout of the new structures would not substantially modify the visual character of the immediate area. Construction of the expanded intake and new pump station would not result in a substantial impact on the site's visual character and the impact would be less than significant.

Operation Impacts. Long-term impacts related to pipeline installation and delivery of water to farms and the refuges would be similar to Alternatives 1 and 2 (see discussion above for details).

Regarding the new facilities at the PID intake, the expanded fish screen and new pump would be consistent with the existing character of the surrounding area. As such, long-term impacts on scenic resources and the visual character of the area would be less than significant.

No Action Alternative

Under the No Action Alternative, no pipeline or pump station construction work would occur. Therefore, no construction-related impacts on scenic resources or the area's visual character would occur.

In the long-term, the Cities of Modesto and Turlock would discharge recycled water to the San Joaquin River and DPWD would continue to rely on the CVP for its primary water supply. The District would continue to execute water transfers / exchanges and pump groundwater from private wells. The fallowing of land would continue and refuges would not receive water for wildlife management. Under these conditions, views of fallowed fields (typically consist of dry vegetation or bare soil) may become more prevalent. Similarly, if the refuges do not receive supplemental water, vegetation may become more dry. Any increase in fallowed land would incrementally degrade the open and rural visual character of the area. As views of the study area are visible from I-5, a state-designated scenic highway, some viewers may perceive the fallowing of land and dried vegetation as a visual degradation. From this highway, motorists would still have intermittent views of irrigated agriculture. Since views of the study area are fleeting and because motorists are expected to be focused on the road to ensure safe driving, impacts on scenic resources and the study area's visual character would be less than significant.

Significance Determination

Less than significant for all action alternatives.

Mitigation Measures

None.

Impact AES-2 New Sources of Substantial Light or Glare.

Combined Alignment Alternative

Construction Impacts. As discussed in *Chapter 2, Alternatives and Proposed Project/Action*, throughout the approximately 1.5-year construction duration, construction activities would primarily occur on weekdays from 7:00 AM to 6:00 PM. However, if necessary, construction could take place during

nighttime and the contractor would be responsible for obtaining permits for any nighttime construction. Temporary views of nighttime construction lighting could be a nuisance to adjacent residences and motorists traveling on the affected roadway. To minimize any temporary adverse effects on residential views during the duration of nighttime construction, implementation of **Mitigation Measure AES-1** would ensure that nighttime construction lighting is shielded and oriented downward and would reduce this impact a less-than-significant level.

Operation Impacts. As described above under Impact AES-1, once constructed, all recycled water pipelines would be underground and would therefore not result in a new source of substantial light or glare.

Improvements at the existing Jennings Plant outfall pump station would be minimal and consist of replacing an existing transformer, modifications to discharge piping, replacement of the pumps within the existing pump station structure and other interior modifications. None of these modifications would result in any changes to the exterior of the existing pump station building nor would it require new lighting. For these reasons and because no publicly accessible views of the pump station are available, the Combined Alignment Alternative would not adversely affect nighttime views in the area.

Separate Alignment Alternative

Construction Impacts. Similar to the Combined Alignment Alternative, construction activities associated with the Separate Alignment Alternative would primarily occur on weekdays between 7:00 AM and 6:00 PM, but some nighttime construction may be necessary. Potential construction-related impacts associated with nighttime construction would be the same as the Combined Alignment Alternative. See the impact discussion above for detailed information.

Operation Impacts. For the Separate Alignment Alternative, one pump station would be constructed at the western end of the Harding Drain Bypass Pipeline and the existing Jennings Plant outfall pump station at the northern reach would be repurposed. Light and glare impacts associated with modifications to the Jennings Plant outfall pump station would be the same as Alternative 1 (see above discussion for detailed information). As shown in **Figure 2-6** in *Chapter 2*, *Alternatives and Proposed Project/Action*, the new pump station building would rise up to 20 feet aboveground and would have dimensions of approximately 40 feet x 50 feet. Automatic-sensor lights would be installed outside for safety and security purposes. New lights would represent a new permanent source of light and could be seen from South Carpenter Road. Lights would be motion-activated and so would not always be on; however, views of nighttime lighting could be a nuisance to motorists traveling on South Carpenter Road, which would be a potentially significant impact. **Mitigation Measure AES-2** would ensure that lights would be shielded and directed inward/downward towards the facilities and would therefore not generate substantial glare. For this reason and because there are no other sensitive viewers in the area, the impact related to new permanent sources of light and glare would be less than significant with mitigation.

PID Conveyance Alternative

Construction Impacts. Similar to the Alternatives 1 and 2, construction activities associated with the PID Conveyance Alternative would primarily occur on weekdays between 7:00 AM and 6:00 PM but some nighttime construction may be necessary. Potential construction-related impacts associated with nighttime construction would be the same as for Alternatives 1 and 2. See the impact discussion above for detailed information.

Operation Impacts. Light and glare impacts associated with modifications at the PID intake facility would be the similar to those for The Combined Alignment Alternative (see above discussion). Security lighting is currently installed at the intake and any new lighting would be motion-activated and thus would not always be on. For this reason and because there are very few residences in the area, the impact related to new permanent sources of light and glare would be less than significant.

No Action Alternative

Under the No Action Alternative, no new lighting would be installed. As such no new permanent sources of light and glare would be created and no impact would occur.

Significance Determination before Mitigation

Potentially significant for all action alternatives.

Mitigation Measures

Mitigation Measure AES-1: Nighttime Construction Lighting (Alternatives 1, 2 and 3).

Nighttime construction lighting, if required, shall be shielded and oriented downward to minimize effects on any nearby receptors. Lighting shall be directed toward active construction areas only, and shall have the minimum brightness necessary to ensure worker safety.

Mitigation Measure AES-2: Directional Security Lighting for New Pump Station at Harding Drain Bypass Pipeline (Alternative 2).

Night time security and associated parking lighting fixtures will be equipped with directional shields that aim light downward and away from adjacent roadways. In addition, the placement of lighting fixtures would be selected to concentrate light on-site to avoid spillover.

Significance after Mitigation

Less than significant.

Cumulative Impact Analysis

The geographic scope of the cumulative impacts on aesthetic resources encompasses the study area and surrounding areas. If the proposed project, as well as other projects listed in **Table 3.0-1**, would adversely affect the same scenic resources or views from public roads, they could result in a significant cumulative impacts on scenic resources and the visual character of the area.

As discussed in Impact AES-1, during the construction phase, Alternatives 1, 2 and 3 would temporarily degrade the visual character of the study area, which would be visible from roadways such as Lemon Avenue, Zacharias Road, Carpenter Road, Pomegranate Avenue, Bartch Avenue, Ward Avenue and other intersecting public roads. Of the projects listed in **Table 3.0-1**, the Jennings Road Treatment Plant Phase 2 Upgrades project, Stanislaus County's West Main Street Highway Improvement Project, and the Stanislaus Council of Governments' South County Corridor Study would be closest to the study area. Construction of the Jennings Road Treatment Plant Phase 2 Upgrades project is currently underway and could overlap with the proposed project's construction schedule. Since construction timing of the West Main Street Highway Improvement Project and the South County Corridor Study is undetermined, this analysis conservatively assumes that the construction schedule of those two projects would overlap with the proposed project's schedule. As discussed in Impact AES-1, during the construction phase, the construction contractor would be required to clean up work areas at the end of every work day. If pipeline construction on West Main Avenue overlaps with construction associated with the West Main Street Highway Improvement Project and the South County Corridor Study, residents and motorists traveling on West Main would have longer views of construction activities and equipment along this road than that resulting from the proposed project alone. However, given the temporary nature of project construction and short duration of views available to motorists and residents, and through compliance with standard environmental commitments related to site cleanliness, the proposed project's contribution to this cumulative construction-related impact on visual resources would not be considerable and thus would be less than significant. As discussed in Impact AES-1, the Alternative 2 pump station would be visible from South Carpenter Road. None of the cumulative projects identified in **Table 3.0-1** would occur in the vicinity of this pump station site. Therefore, there would be no long-term cumulative impact on visual resources to which the proposed project could contribute, and there would be no impact.

Lastly, as described in Impact AES-2, in the event that pipeline construction requires nighttime construction lighting, the project could create a nuisance to motorists and residents near the work areas. Any construction lighting needed for the West Main Street Highway Improvement Project and the South County Corridor Study could also create a nuisance to these sensitive viewers along West Main Street (between Jennings Road and South Carpenter Road). However, implementation of **Mitigation Measure AES-1 (Nighttime Construction Lighting)** would ensure that construction lighting is oriented downwards towards the work areas and avoid glare. With implementation of this measure, the proposed project's contribution to this cumulative impact would not be considerable and would be less than significant. Lastly, the Alternative 2 pump station would include exterior automatic-sensor lighting. Since none of the cumulative projects identified in **Table 3.0-1** would occur in the vicinity of this pump station site, there would be no long-term cumulative impact related to permanent light and glare effects to which the proposed project could contribute, and there would be no impact.

Significance Determination

Less than significant with mitigation.

Mitigation Measures

See Mitigation Measure AES-1.

3.1.4 References

California Department of Transportation (Caltrans), 2014. California Scenic Highway Mapping System, available online at: http://www.caltrans.ca.gov/hq/LandArch/scenic_highways/index.htm, accessed June 30, 2014.

Modesto, City of. 2008. Final Urban General Plan. October 14.

Stanislaus County, 1994. Stanislaus County General Plan: Chapter 3, Conservation Element. Available at: http://www.stancounty.com/planning/pl/gp/gp-chapter3.pdf.

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3.2 Agriculture and Forestry Resources

This section evaluates the potential adverse impacts related to agriculture that could result from implementation of the proposed NVRRWP. No forestry resources exist in the study area and so impacts to these resources have not been evaluated.

3.2.1 Environmental Setting/Affected Environment

The study area for this analysis includes parts of Stanislaus, San Joaquin and Merced Counties in California's Central Valley. While all construction would take place in Stanislaus County, the proposed project could affect agricultural areas in other counties as well. Specifically, recycled water provided by the project would be used to irrigate farmland in DPWD's service area, which includes parts of San Joaquin, Stanislaus and Merced Counties (see **Figure 2-1**). Information is provided below on the agricultural resources of the area which would be affected by the proposed project.

Del Puerto Water District

As described in *Chapter 2, Alternatives and Proposed Project/Action,* DPWD provides agricultural irrigation water to approximately 45,000 acres of productive farmland in Stanislaus, San Joaquin, and Merced Counties. Currently, DPWD's primary source of water is from a contract with Reclamation which provides for the delivery of up to 140,210 acre-feet (AF) of CVP water annually. DPWD's CVP water allocations have been substantially reduced since the 1990s due to Delta pumping restrictions resulting from the passage of the CVPIA, water rights decisions, need to meet Delta water quality objectives, biological opinions for protection of salmon and smelt, and drought conditions. In 2009, DPWD received only 10 percent (i.e., 14,000 AFY) of its contract allocation. DPWD's contract supply for 2013 was 20 percent of their contracted allocation (28,000 AFY), while the 2014 allocation is 0 percent. **Figure 1-2** shows the historical DPWD CVP allocations from 1990 to 2013 and the downward trend in the annual allocations.

Shortages in CVP deliveries have resulted in fallowing of land within DPWD's service area that would otherwise have been planted. **Table 3.2-1** shows the acreage of land in the DPWD service area that has been fallowed from 2001 through 2013. From 2001 to 2013 the percentage of fallowed land ranged from 12 to 24 percent. Due to reduced availability of surface water and insufficient quantities of groundwater, preliminary reports indicate that 11,020 acres of agricultural land were fallowed in 2014. Fallowing is not an option for orchard crops, which need to be irrigated each and every year.

It is predicted that future deliveries from the CVP to DPWD will average approximately 49,000 AFY, an allocation of only 1 AF/acre, which is inadequate to meet the District's water demand. This would result in an anticipated shortfall of 41,000 AFY (see **Figure 1-3)**. If compared to the 2013 supplies or the average of contractual water supplies over the last five years, the shortfall would range from approximately 40,000 to 60,000 AFY. The 2014 shortfall is 90,000 AFY.

Table 3.2-1: Acres of Fallowed Land in DPWD

Year	Fallowed Acreage
2001	6,763
2002	5,584
2003	6,826
2004	8,455
2005	6,431
2006	7,556
2007	8,654
2008	8,336
2009	10,737
2010	9,016
2011	6,204
2012	6,486
2013	7,239

Source: Del Puerto Water District Crop Report Summary, 2014

Crops and Production

Stanislaus County

Stanislaus County consistently ranks among the top ten agricultural counties in the state. Agriculture in Stanislaus County generates more than a billion dollars annually and is the County's leading industry (Stanislaus County No Date). As shown in **Table 3.2-2**, a wide range of agricultural commodities are produced in Stanislaus County.

Table 3.2-2: Stanislaus County 2012 Agricultural Production by Commodity Category

Category	Harvest Acreage	Total
Fruit and Nut Crops	227,113	$1,264,991,000
Vegetable Crops	47,372	$186,907,000
Field Crops	725,515	$297,856,000
Other Agriculture	N/A	$25,801,000
Seed Crops	986	$1,268,000
Nursery Products	1,836	$109,432,000
Organic Products	4,113	$14,572,000
Apiary Products	N/A	$58,122,000
Livestock and Poultry	N/A	$540,244,000
Livestock and Poultry Products	N/A	$778,652,000
Total	1,006,995	$3,227,843,000

Source: Stanislaus Agricultural Commissioner's Office 2012

Milk and almonds are the two biggest commodities by total value produced in the County. **Table 3.2-3** shows the top 10 commodities in Stanislaus County**.**

Table 3.2-3: Stanislaus County Top 10 Agricultural Commodities in 2012

Commodity	Rank	Value
Milk, All	1	$739,630,000
Almonds	2	$735,826,000
Chickens, All	3	$245,771,000
Cattle & Calves, All	4	$214,217,000
Walnuts	5	$213,600,000
Silage, All	6	$148,557,000
Tomatoes, All	7	$121,148,000
Grapes, All	8	$82,439,000
Turkeys, All	9	$74,515,000
Deciduous Fruit & Nut Industry	10	$64,398,000

Source: Stanislaus Agricultural Commissioner's Office 2012

Merced County

Like Stanislaus County, Merced County is a major agricultural county in California. The total value of agricultural commodities produced in Merced County was approximately $2.8 billion in 2012 (Merced County Department of Agriculture 2012). Agriculture is Merced County's number one industry and largest employer. Merced County is one of the top five producers of milk/cream, cheese, sweet potatoes, figs, cantaloupes, fresh market tomatoes, honey, almonds, cotton, sugar beets, eggs/chickens, turkeys, cattle/calves, pasture, silage, corn, honey and hay (Norton et al. 2011). **Table 3.2-4** shows agricultural production and harvest acreage in Merced County in 2012 by commodity category.

Table 3.2-4: Merced County 2012 Agricultural Production by Commodity Category

Category	Harvest Acreage	Value
Fruit and Nut Crops	130,835	$664,510,000
Vegetable Crops	45,327	$323,386,000
Field Crops	969,601	$490,294,000
Other Agriculture	N/A	$13,505,000
Seed Crops	4,756	$5,929,000
Nursery Products	1,554	$47,736,000
Apiary Products	N/A	$25,473,000
Livestock and Poultry Production	N/A	$669,453,000
Livestock and Poultry Products	N/A	$1,038,014,000
Total	1,152,073	$3,278,300,000

Source: Merced County Department of Agriculture 2012

In terms of specific commodities, milk and almonds were the two biggest commodities by total value produced in the County in 2012 (see **Table 3.2-5**).

Table 3.2-5: Merced County Top 10 Agricultural Commodities in 2012

Commodity	Rank	Value
Milk *(includes Market & Manufacturing)*	1	$940,236,000
Almonds *(Kernel Basis)*	2	$471,363,000
Cattle & Calves	3	$296,891,000
Chickens *(includes Fryers & Other Chickens)*	4	$290,180,000
Sweet Potatoes	5	$160,543,000
Hay (*Alfalfa)*	6	$131,885,000
Tomatoes *(includes Market & Processing Tomatoes)*	7	$115,710,000
Silage *(Corn)*	8	$109,221,000
Cotton *(includes Acala & Pima Cotton)*	9	$88,372,000
Chicken Eggs *(Market)*	10	$81,726,000

Source: Merced County Department of Agriculture 2012

San Joaquin County

Like Stanislaus and Merced Counties, San Joaquin County has a robust agricultural industry. San Joaquin County consistently leads the state in the production value of apples, asparagus, cherries, grain corn and walnuts (San Joaquin County Agricultural Commissioner's Office 2012). In 2012, these five crops generated $833,452,000 (San Joaquin County Agricultural Commissioner's Office 2012). **Table 3.2-6** shows agricultural production in San Joaquin County in 2012 by commodity category and total agricultural production and harvest acreage.

Table 3.2-6: San Joaquin County 2012 Agricultural Production by Commodity Category

Category	Harvest Acreage	Value
Fruit and Nut Crops	253,000	$1,640,372,000
Vegetable Crops	55,300	$265,568,000
Field Crops	508,000	$329,973,000
Seed Crops	1,180	$3,562,000
Nursery Products	N/A	$87,957,000
Apiary Products	N/A	$21,610,000
Livestock and Poultry Production	N/A	$97,151,000
Livestock and Poultry Products	N/A	$423,279,000
Total	817,480	$2,869,472,000

Source: San Joaquin County Agricultural Commissioner's Office 2012

In terms of specific commodities, grapes and walnuts were the top two agricultural commodities produced in the county in 2012, followed by milk, almonds, cherries and tomatoes (see **Table 3.2-7**).

Table 3.2-7: San Joaquin County Top 10 Agricultural Commodities in 2012

Commodity	Rank	Value
Grapes	1	$549,000,000
Walnuts	2	$457,000,000
Milk	3	$404,000,000
Almonds	4	$300,000,000
Cherries	5	$225,000,000
Tomatoes	6	$103,000,000
Hay	7	$90,000,000
Silage Corn	8	$72,000,000
Grain Corn	9	$70,000,000
Cattle, Calves	10	$67,000,000

Source: San Joaquin County Agricultural Commissioner's Office 2012

Types of Farmland

The definitions of the various types of farmland discussed below are provided in the *Section 3.2.2, Regulatory Framework, State Policies and Regulations, Farmland Mapping and Monitoring Program.*

Important Farmland

Much of the study area is classified by the California Department of Conservation (CDOC) as Prime Farmland. As shown in **Figure 3.2-1**, nearly all the land adjacent to the proposed pipeline from the Modesto WQFC to the DMC (both Alternatives) is Prime Farmland (CDOC 2012a). The land adjacent to the proposed pipeline from the Harding Drain Bypass to the Jennings Plant Pump Station (Alternative 1) is generally classified as Prime Farmland (with some patches of Farmland of Statewide Importance). The pipeline from the Harding Drain Bypass to the DMC (Alternative 2) also passes through Prime Farmland (CDOC 2012a).

Williamson Act Contracts

As shown in **Figure 3.2-2**, numerous Williamson Act Contract lands exist within the study area. A number of parcels adjacent to the proposed pipeline from the Modesto WQFC to the DMC (both Alternatives) are under Williamson Act Contracts (CDOC 2012b). Several parcels along the proposed pipeline from the Harding Drain Bypass Pipeline to the Jennings Plant Pump Station (Alternative 1) are enrolled in Williamson Act Contracts (primarily parcels along S. Carpenter Road) (see **Figure 3.2-2**). A number of parcels along the proposed pipeline from the Harding Drain Bypass Pipeline to the DMC are under Williamson Act Contracts (CDOC 2012b).

Figure 3.2-1: FMMP Farmland Types

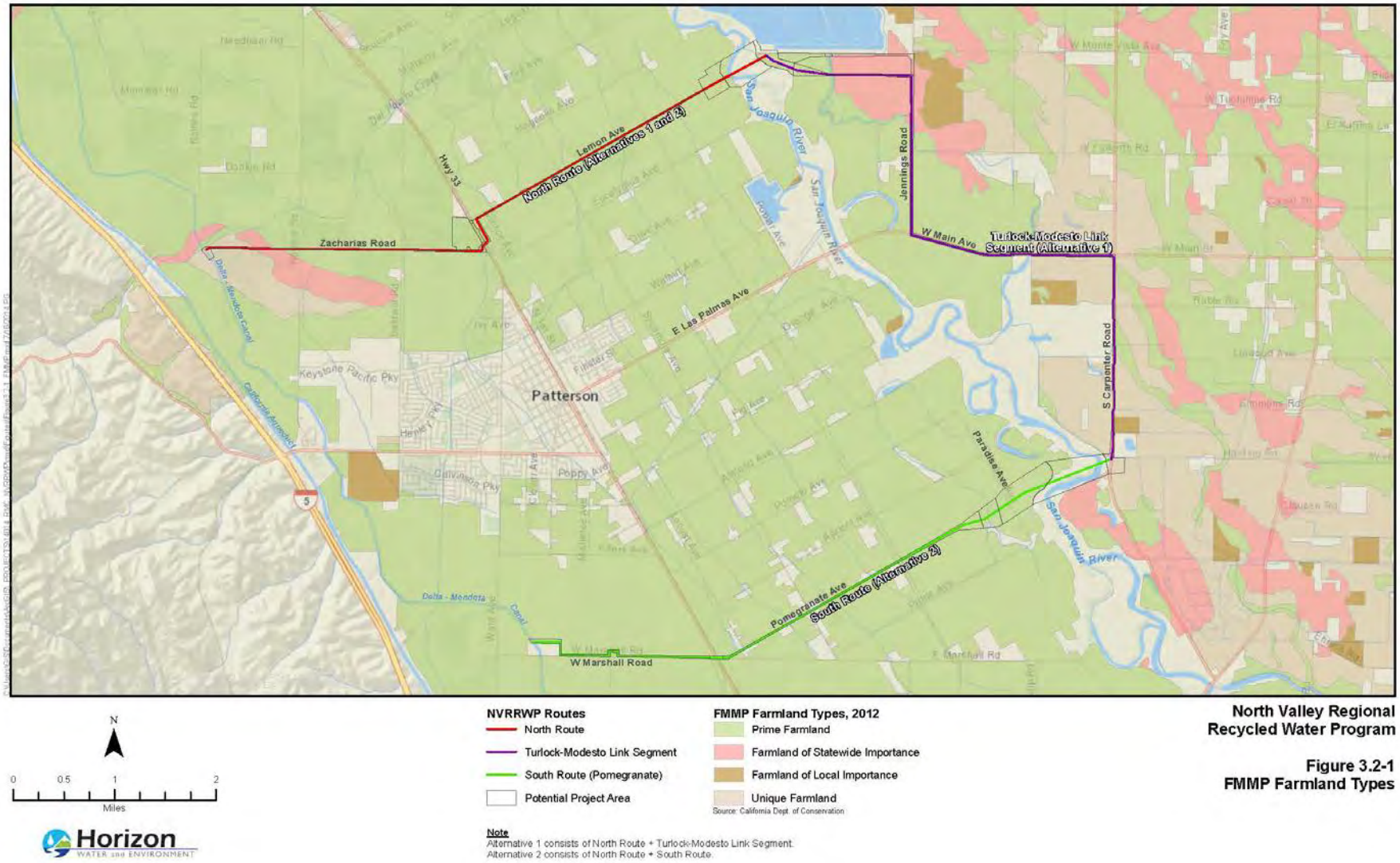

Figure 3.2-2: Williams Act Lands

3.2.2 Regulatory Framework

This section describes laws and regulations at the federal, state, and local level that apply to agriculture and the proposed project.

Federal Policies and Regulations

Farmland Protection Policy Act

The FPPA requires federal agencies to (a) evaluate the adverse effects of their programs on the preservation of farmland; (b) consider alternative actions that could lessen adverse effects, and (c) ensure that their programs are compatible with state and local programs and policies for the protection of farmland. Farmland is defined as prime or unique farmlands as determined by the appropriate state or local agency. Federal agencies are required to develop and review their policies and procedures to implement the FPPA every two years (USDA 2014).

State Policies and Regulations

Farmland Mapping and Monitoring Program

The Farmland Mapping and Monitoring Program (FMMP), administered by CDOC, produces maps and statistical data for use in analyzing impacts on California's agricultural resources (CDOC 2013a). The FMMP rates agricultural land according to soil quality and irrigation status and publishes Important Farmland maps. FMMP maps are updated every two years using a computer mapping system, aerial imagery, public review, and field reconnaissance (CDOC 2013a). Important Farmland categories are as follows (CDOC 2013b):

- ***Prime Farmland:*** Farmland with the best combination of physical and chemical features able to sustain long-term agricultural production. These lands have the soil quality, growing season, and moisture supply needed to produce sustained high yields. Prime Farmland must have been used for irrigated agricultural production at some time during the 4 years before the FMMP's mapping date.
- ***Farmland of Statewide Importance:*** Farmland similar to Prime Farmland, but with minor shortcomings, such as greater slopes or less ability to store soil moisture. Farmland of Statewide Importance must have been used for irrigated agricultural production at some time during the 4 years before the FMMP's mapping date.
- ***Unique Farmland:*** Farmland of lesser quality soils used for the production of the state's leading agricultural crops. These lands usually are irrigated but may include non-irrigated orchards or vineyards as found in some climatic zones. Unique Farmland must have been cropped at some time during the 4 years before the FMMP's mapping date.
- ***Farmland of Local Importance:*** Land of importance to the local agricultural economy as determined by each county's board of supervisors and a local advisory committee.

California Land Conservation Act of 1965 (Williamson Act)

The California Land Conservation Act of 1965 (commonly referred to as the Williamson Act) allows local governments to enter into contracts with private landowners for the purpose of preventing conversion of agricultural land to non-agricultural uses (CDOC 2013c). In exchange for restricting their property to agricultural or related open space use, landowners receive property tax assessments that are substantially lower than the market rate (tax assessments are based upon farming and open space uses as opposed to full market value).

A Williamson Act contract may be terminated either through nonrenewal (preferred method) or cancellation (CDOC 2013d). To terminate a Williamson Act contract, a landowner may file a notice of nonrenewal. Beginning on the next contract anniversary date, the contract winds down over the

remaining (usually nine-year) term with the landowner's property taxes gradually increasing until they reach the full unrestricted rate at the end of the nonrenewal period (CDOC 2013d).

According to the Williamson Act 2010 Status Report, approximately 15 million acres were enrolled under the Williamson Act statewide as of 2011 (CDOC 2013e). As of 2010, Stanislaus County had 690,110 acres under Williamson Act enrollment. Both Merced and San Joaquin Counties also have lands under Williamson Act contract, but as no project facilities would be located in those counties, the proposed project/action has no potential to affect lands under Williamson Act contract in Merced or San Joaquin County.

Local Policies and Regulations

Physical facilities for the project would be located in Stanislaus County. The Modesto Jennings Plant is within the Modesto City limits. Policies for Stanislaus County and the City of Modesto are presented below.

Stanislaus County General Plan

The Stanislaus County General Plan (Stanislaus County, 2011) regulates land use and development in unincorporated areas of Stanislaus County and outlines goals and policies to guide zoning and land use decisions. The Stanislaus County General Plan contains the following goals, objectives and policies related to agricultural resources and the proposed project:

GOAL ONE: Strengthen the agricultural sector of our economy.

Objective Number 1.2: Support the development of agriculture-related uses

Policy 1.7: Concentrations of commercial and industrial uses, even if related to surrounding agricultural activities, are detrimental to the primary use of the land for agriculture and shall not be allowed.

Objective Number 1.3: Minimizing Agricultural Conflicts

Policy 1.10: The County shall protect agricultural operations from conflicts with non-agricultural uses by requiring buffers between proposed non-agricultural uses and adjacent agricultural operations.

GOAL TWO: Conserve our agricultural lands for agricultural uses.

Objective Number 2.1: Continued Participation in the Williamson Act

Policy 2.1: The County shall continue to provide property tax relief to agricultural landowners by participating in the Williamson Act.

Policy 2.3 The County shall ensure all lands enrolled in the Williamson Act are devoted to agricultural and compatible uses supportive of the long-term conservation of agricultural land.

Objective Number 2.2: Discourage urbanization and the conversion of agricultural land in unincorporated areas of the County

Policy 2.5: To the greatest extent possible, development shall be directed away from the County's most productive agricultural areas.

Policy 2.6: Agricultural lands restricted to agricultural use shall not be assessed to pay for infrastructure needed to accommodate urban development.

Objective Number 2.4: Assessing and mitigating impacts of farmland conversion.

Policy 2.14: When the County determines that the proposed conversion of agricultural land to non-agricultural uses could have a significant effect on the environment, the County shall fully evaluate on a project-specific basis the direct and indirect effects, as well as the cumulative effects of the conversion.

GOAL THREE: Protect the natural resources that sustain our agricultural industry.

Objective Number 3.2: Water Resources

Policy 3.4: The County shall encourage the conservation of water for both agricultural and urban uses.

Policy 3.5: The County will continue to protect the quality of water necessary for crop production and marketing.

Objective Number 3.3: Soil Resources

Policy 3.6: The County shall encourage the conservation of soil resources.

Stanislaus County Zoning Code

The Stanislaus County zoning code dictates land use in unincorporated areas of Stanislaus County and describes allowable uses in designated zoning districts. According to the Stanislaus County zoning districts map, all the land within the study area is assigned to the General Agriculture District (A-2) (Stanislaus County 2010).

As described in the County's zoning code, the intent of the General Agriculture District is "to support and enhance agriculture as the predominant land use in the unincorporated areas of the county. These zoning regulations are also intended to protect open space lands and to ensure that all land uses are compatible with agriculture and open space, including natural resources management, outdoor recreation and enjoyment of scenic beauty (Section 21.20.010)."

In general, permitted uses in the A-2 districts include: all agricultural uses; single-family dwelling(s) on parcels of specified size; mobile homes; buildings and appurtenances generally supportive of farming; temporary agricultural service airports; lagoons or ponds for the storage of animal wastes; and other related uses (Section 21.20.020).

Uses that require a use permit in an A-2 district include (Section 21.20.030):

C. Tier Three. The uses listed below are not directly related to agriculture but may be necessary to serve the A-2 district or may be difficult to locate in an urban area. Some of these uses can be people-intensive and, as a result, have the potential to adversely impact agriculture; these people-intensive uses are generally required to be located within LAFCO-approved spheres of influence of cities or community services districts and sanitary districts serving unincorporated communities. Tier three uses may be allowed when the planning commission finds that, in addition to the findings required under Section 21.96.050:

1. The use as proposed will not be substantially detrimental to or in conflict with agricultural use of other property in the vicinity; and

2. The parcel on which such use is requested is not located in one of the county's "most productive agricultural areas," as that term is used in the agricultural element of the general plan; or the character of the use that is requested is such that the land may reasonably be returned to agricultural use in the future...

j. Facilities for public utilities and communication towers,

In regard to uses on lands subject to the Williamson Act, the County's zoning code states: "Unless the planning commission and/or the board of supervisors makes a finding to the contrary, the following uses

are hereby determined to be consistent with the principles of compatibility and may be approved on contracted land: (1) The erection, construction, alteration, or maintenance of gas, electric, water, communication facilities… (Section 21.20.2045)"

City of Modesto General Plan

The existing Modesto Jennings Wastewater Treatment Plan and several adjacent parcels to the south are within the jurisdiction of the City of Modesto. These include the parcels within and adjacent to the proposed pipeline alignment from the Jennings Plant and Turlock RWQCF (Alternative 1) along Jennings Road and W. Main Avenue. These parcels are all within the Planned Development Zone (P-D) district according to the City's zoning ordinance (see below) and as such would seem to be within the Planned Urbanizing Area, as defined in the City's General Plan (City of Modesto 2008). In regard to the Planned Urbanizing Area, the General Plan states that:

> Future development within the approximately 20,042-acre Planned Urbanizing Area (PUA) will occur on land which is predominantly flat, vacant and/or developed with agricultural uses, and minimally, if at all, served with urban services and infrastructure, including roads…The Planned Urbanizing Area is expected to absorb substantial urban development in a comprehensively planned manner (City of Modesto 2008: page II-2).

Agriculture policies for the Planned Urbanizing Area in the General Plan apply to new development (City of Modesto 2008: page VII-8). The pipelines proposed in the project would likely not be considered new development as they would be located below ground and would not change the existing land use. Nevertheless, the agriculture policies for the Planned Urbanizing Area in the City of Modesto General Plan are as follows:

> *Agricultural Policy (a):* The City will not annex agricultural land unless urban development consistent with the General Plan has been approved by the City.
>
> *Agricultural Policy (b):* The City shall support the continuation of agricultural uses on lands designated for urban uses until urban development is imminent.
>
> *Agricultural Policy (c):* The City shall encourage the County to retain agricultural uses on lands surrounding the General Plan area and on lands within the General Plan area pending their annexation to the City or development by mutual agreement with the County.
>
> *Agricultural Policy (d):* Where necessary to promote planned City growth, the City shall encourage development of those agricultural lands that are already compromised by adjacent urban development or contain property required for the extension of infrastructure or other public facilities, before considering urban development on agricultural lands that are not subject to such urban pressures.
>
> *Agricultural Policy (e):* For any subsequent project that is adjacent to an existing agricultural use, the project proponent may incorporate measures to reduce the potential for conflicts with the agricultural use. Potential measures to be implemented may include the following:
>
> 1) Include a buffer zone of sufficient width between proposed residences and the agricultural use.
> 2) Restrict the intensity of residential uses adjacent to agricultural lands.
> 3) Inform residents about the possible exposure to agricultural chemicals.

City of Modesto Zoning Ordinance

As described above, several parcels along the San Joaquin River within and adjacent to the proposed pipeline alignment from the City of Modesto Jennings Wastewater Treatment Plant to the Turlock RWQCF are within the jurisdiction of the City of Modesto. According to the City of Modesto's zoning

map, all of these parcels are within the Planned Development (P-D) district. As described in Section 21.40.020 of the City's zoning ordinance, the purpose and intent of the P-D district is as follows.

> The application of the conventional regulations can stifle creative planning and design efforts. The P-D district zoning is generally intended to apply to larger scale, integrated development as a means of providing opportunities for creative and cohesive design concepts. The district is intended to allow modification of requirements established by other districts and diversification in the relationship of different uses, buildings, structures, lot sizes and open spaces, while ensuring compliance with, and implementation of, the general plan. Additional objectives of the P-D district include the provision of development consistent with site characteristics, creation of optimum quantity and use of open space, encouragement of good design and promotion of compatible uses. (Ord. CS 556 §1, 1994).

Section 21.40.040 states that "All uses, when consistent with the general plan, shall be allowed in P-D districts subject to the approval of the development plan by the planning commission. (Ord. CS 556 §1, 1994).

3.2.3 Impact Analysis/Environmental Consequences

Methodology for Analysis

This section evaluates whether construction and operation of the facilities associated with the proposed project would result in significant impacts related to agriculture resources. It considers the extent to which the proposed project could result in conversion of farmland to non-agricultural uses, either temporarily or permanently. In general, temporary impacts would not be considered significant. It also considers the proposed project's consistency with existing zoning in the locations where facilities would be modified or constructed.

Impacts to forestry are not evaluated because no forestry resources exist within the study area.

Thresholds of Significance

Consistent with Appendix G of the *CEQA Guidelines,* an agricultural impact would be considered significant if the project would:

- Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program (FMMP) of the California Resources Agency, to nonagricultural use;
- Conflict with existing zoning for agricultural use, or a Williamson Act contract;
- Involve other changes in the existing environment that, because of their location or nature, could result in a conversion of Farmland to a non-agricultural use.

Impacts and Mitigation Measures

Impact AG-1 Convert Farmland to Non-Agricultural Use

Combined Alignment Alternative

Alternative 1 involves installation of pipelines and appurtenances (two reaches) and repurposing of the existing Jennings Plant outfall pump station. As described in **Table 2-1** and shown in **Figure 2-2**, the majority of the length of the two pipeline reaches proposed in Alternative 1 would be located along County roadways. Two segments of the reach from the Jennings Plant to the DMC would cross agricultural land; from roughly the San Joaquin River to Lemon Avenue and from Highway 33 to the intersection of Zacharias Road and Baldwin Road. The agricultural land through which these segments of pipeline would be constructed is designated as Prime Farmland (see **Figure 3.2-1**).

As described in *Chapter 2, Alternatives and Proposed Project/Action*, pipeline would be installed using open-cut construction methods. The open-cut trench would range from 6 to 8 feet wide and

approximately 8 to 10 feet deep, depending on the pipe size, existing utility locations, and pipe bedding requirements. To accommodate construction equipment and work area, the entire construction corridor (active work area including the trench) would be approximately 45 feet wide.

Installation of pipeline along roads would be conducted primarily within the public right-of-way (i.e., within the width of the road). The work area may extend onto adjacent agricultural land in locations where the public right-of-way is too narrow to accommodate pipeline construction.

In areas where the construction corridor would be located within agricultural lands, agriculture would be temporarily precluded for some portion of the 1.5-year construction period. Construction in agricultural fields may require the removal of crops, depending on the crop and time of year. Because of the temporary nature of this impact, it is considered less than significant.

Construction would also involve the removal of topsoil (to dig the trench). Heavy equipment (e.g., excavator, dump truck, flat-bed truck, front-end loader) would be used to dig trenches, transport pipe, and off-load excavated materials. Removal of topsoil and use of heavy equipment would also have the potential to adversely affect long-term soil characteristics and productivity of this land (i.e., through compaction/removal of topsoil). Potential exists that this could cause such areas to no longer be viable for agricultural production, which would be a significant impact. Implementation of **Mitigation Measure AG-1** would require that topsoil is stockpiled and replaced, reducing this impact to a level that is less than significant and compliant with Policy 3.6 of Stanislaus County's General Plan (i.e., to conserve soil) (see Regulatory Framework above).

Otherwise, over the long term, agricultural land use in this area would be unaffected as a result of the proposed pipelines in Alternative 1. The pipe would be installed from 8 to 10 feet deep and soil would be backfilled over the trench such that farming would be able to resume following construction. The pipeline would need to be inspected and maintained after construction (for which permanent easements would be acquired as necessary), but inspection and maintenance activities would not be expected to significantly affect agricultural operations.

Separate Alignment Alternative

The potential impacts associated with the pipeline reaches in Alternative 2 would be the same as for Alternative 1, described above. In addition to the locations where the pipeline would traverse agricultural lands under Alternative 1, portions of the pipeline reach from Harding Drain Bypass Pipeline to the DMC would pass through agricultural fields designated as Prime Farmland. As described in **Table 2-2**, a segment of this reach would pass through agricultural fields designated as Prime Farmland roughly between the San Joaquin River and Pomegranate Avenue. Another segment of this reach would run parallel and north of West Marshall Road (up to 80 feet north of West Marshall Road) between Highway 33 and the DMC. The land adjacent to West Marshall Road to the north is classified as Prime Farmland (see **Figure 3.2-1**). Potential impacts (i.e., conversion of farmland to non-agricultural use) from pipeline installation in these areas would be the same as those described above for Alternative 1. In general, construction-related impacts in agricultural fields would be temporary and unlikely to result in permanent conversion of farmland to non-agricultural use. Potentially significant impacts to soil resources from construction would be reduced to a less than significant level with implementation of **Mitigation Measure AG-1**.

Alternative 2 would include the same repurposing of the existing Jennings Plant outfall pump station as described for Alternative 1, and the potential impacts would be the same as those described for Alternative 1 above.

Alternative 2 would also involve construction of a new pump station near the west end of the Harding Drain Bypass Pipeline. As described in *Chapter 2, Alternatives and Proposed Project/Action,* the proposed pump station at the Harding Drain Bypass Pipeline would be above ground and enclosed.

Figure 2-5 shows the site plan for the new pump station. The above grade pump station building would be approximately 40 feet by 50 feet and would be surrounded by paving for access and a fence to ensure security.

The pump station site on the west of S. Carpenter Road (and east of the San Joaquin River) is owned by the City of Turlock and is not classified as Important Farmland. Therefore no conversion of farmland to non-agricultural use would occur.

PID Conveyance Alternative

The majority of the pipeline could be constructed in PID ROW adjacent to their main canal and would not be expected to affect farmland. There are parcels of prime farmland located along Bartch and Ward Avenues, and there is a possibility that pipeline construction could temporarily affect portions of those agricultural lands immediately adjacent to those roadways. Potentially significant impacts to soil resources from construction would be reduced to a less than significant level with implementation of **Mitigation Measure AG-1**.

Alternative 3 would include construction of new facilities at the PID intake, which is not designated as Prime Farmland, Unique Farmland or Farmland of Statewide Importance (PID 2006). Therefore no conversion of farmland to non-agricultural use would occur.

No Action Alternative

In the No Action Alternative, no pipelines would be installed and existing agricultural land would not be affected. There would be no impact associated with construction. However, over the long-term a lack of reliable water supply could result in conversion of agriculture land to non-agricultural uses. This would be a significant impact for which no mitigation is available.

Significance Determination before Mitigation

Potentially significant (Alternatives 1, 2 and 3); Significant and unavoidable (No Action Alternative).

Mitigation Measures

Mitigation Measure AG-1: Stockpile Soil (Alternatives 1, 2 and 3)

Topsoil removed during project construction shall be stockpiled for later reuse. Soil shall be stored in a clear area of the construction site where it would not have the potential to affect agricultural or biological resources. Stockpiled soil shall be covered with a tarp at all times to prevent generation of fugitive dust. Following pipeline insertion, soil shall be backfilled into the trench and restored to an appropriate level of compaction.

Significance after Mitigation

Less than significant (Alternatives 1, 2 and 3); Significant and unavoidable (No Action Alternative).

Impact AG-2 Conflict with Existing Zoning for Agricultural Use

Combined Alignment Alternative

As described in **Impact AG-1**, the majority of the length of the two pipeline reaches proposed in Alternative 1 would follow the public right-of-way, but some construction may occur within lands zoned for agriculture.

Repurposing of the existing Jennings Plant outfall pump station would be generally contained within the footprint of the existing facility, but the construction work area may extend onto adjacent land. The land adjacent to the existing Jennings Plant is zoned for agriculture by Stanislaus County but is within the jurisdiction of the City of Modesto. As described in Section 3.2.2, Regulatory Framework, this land is zoned for Planned Development (P-D) by the City of Modesto and designated as Planned Urbanizing Area in the City's general plan. The Planned Urbanizing Area is intended to absorb suburban

development, but the general plan encourages preservation of agricultural uses in these areas until urban development is imminent. The Project would not conflict with the agricultural policies of this land use designation or zoning district. The outfall pump station, once repurposed, would be contained within the footprint of the existing facility and any pipelines through P-D zoning district land would be underground and would not affect agriculture.

Where the public right-of-way is not wide enough to accommodate the construction work area, installation of pipeline along roads may extend onto adjacent land zoned for agriculture. Other than the existing Jennings Plant and adjacent parcels to the south, the entire Project area is within the jurisdiction of Stanislaus County. All the land within and adjacent to the proposed pipeline alignments is zoned for agriculture by Stanislaus County. Given that construction impacts would be temporary and agriculture would be anticipated to resume following construction, construction would not conflict with the purpose of Stanislaus County's General Agriculture District zoning designation, which is to "support and enhance agriculture as the predominant land use in the unincorporated areas of the county…and to ensure that all land uses are compatible with agriculture (Section 21.20.010)." Following construction, the project area would be suitable for agriculture and agriculture would remain the predominant land use in the project area.

While the General Agriculture District regulations do not specifically reference water pipelines or utilities in their list of permitted uses, the proposed recycled water pipelines would be considered "appurtenances generally supportive of farming," which are defined as allowable in the Agriculture District under Section 21.20.010 of the Stanislaus County zoning code. The proposed pipelines would be used to convey irrigation water to be used on farmland in DPWD's service area.

In regard to Williamson Act contract lands, Section 21.20.045 of the Stanislaus County code states that "the erection, construction, alteration, or maintenance of gas, electric, water, [and/or] communication facilities" may be approved on Williamson Act contract lands unless the planning commission and/or the board of supervisors makes a finding to the contrary. Installation of pipelines through Williamson Act contract lands for the proposed project would appear to be allowable under this section of the County code.

The proposed pipelines would need to be inspected and maintained on a periodic basis, but such activities would not be expected to conflict with agricultural operations. Operation of the pipelines and project facilities after construction, including inspection and maintenance, do not appear to require a use permit under Section 21.20.030 of the Stanislaus County code because it would not be substantially detrimental to or in conflict with agricultural use of other property in the vicinity and would not prevent agricultural use of the land.

Serving water to the lands zoned for agriculture in DPWD's service area would support the zoning designations in those locations, which is considered a beneficial impact.

Because Alternative 1 would be consistent with and support agricultural zoning, impacts are considered beneficial.

Separate Alignment Alternative

The potential impacts associated with the pipeline reach from Jennings Plant to the DMC and the existing Jennings Plant outfall pump station would be the same for Alternative 2 as for Alternative 1, described above.

As described in **Impact AG-1**, Alternative 2 would also involve construction of a new pump station at the western end of the Harding Drain Bypass Pipeline, which would be sited to the west of S. Carpenter Road (on APN 058-023-028). The land to the west of S. Carpenter Road is not currently in agricultural production or designated as Important Farmland, but it is still zoned for agricultural use by Stanislaus County.

On its face, the pump station would seem to conflict with the purpose of Stanislaus County's General Agriculture District, as it would not allow for agriculture within its footprint. However, the pump station would support conveyance of recycled water to DPWD's service area for irrigation of agricultural lands, and could therefore be considered to be serving "to support and enhance agriculture as the predominant land use in unincorporated areas of the county (Stanislaus County Zoning Code, Section 21.20.010)." This use would be consistent with Stanislaus County's zoning code. Similar to the pipelines, the pump station could also be considered an "appurtenance generally supportive of farming," as described in Stanislaus County's zoning code, and therefore permitted in the Agriculture District.

Overall, given that the pump station would be located on land not currently in agricultural production and that the pump station would only preclude a small area (roughly the size of the footprint of the above ground pump station building [approximately 40 feet by 50 feet] and surrounding pavement and fencing) from agricultural use in the future, the impact would be less than significant.

Like Alternative 1, Alternative 2 would serve water to lands zoned for agricultural use in DPWD's service area and thereby support the zoning designations in those locations.

PID Conveyance Alternative

There are agricultural lands located along both sides of Bartch and Ward Avenues, but as noted above construction of pipelines is supportive of farming and is allowable under the zoning code. Impacts of the pipeline would be similar to Alternatives 1 and 2, described above. The site for the expanded intake and pump station is within PID ROW and would not conflict with agricultural zoning.

Like Alternatives 1 and 2, Alternative 3 would serve water to lands zoned for agricultural use within DPWD's service area and thereby support the zoning designations in those locations.

No Action Alternative

The No Action Alternative would be a continuation of existing conditions. No pipelines or pump station would be installed on land zoned for agriculture and there would be no potential for conflict with existing zoning for agricultural use.

Also, under the No Action Alternative no recycled water would be provided to farmland in DPWD's service area. As described in **Impact AG-1**, DPWD's current and predicted future supplies are not sufficient to meet demands. As such, the No Action Alternative could potentially result in fallowing of lands in DPWD's service area and ultimately, conversion of agricultural land to non-agricultural use. Because the extent of conversion and future uses of any such land are unknown and speculative, it is unknown whether such land uses would be in conflict with zoning for agricultural use. As such, there would be no impact.

Significance Determination

Beneficial (Alternatives 1 and 3); Less than significant (Alternative 2); No impact (No Action Alternative)

Mitigation Measures

No mitigation is necessary.

Impact AG-3 Conflict with Williamson Act Contract

Combined Alignment Alternative

Several parcels within or adjacent to the proposed pipeline alignment under Alternative 1 are under Williamson Act contracts. The land between Highway 33 and the intersection of Zacharias Road and Baldwin Road and between the San Joaquin River and Lemon Avenue (through which pipeline would be

installed) is under Williamson Act contract. The land directly adjacent to the existing Jennings Plant outfall pump station is not under a Williamson Act contract.

As described in **Impact AG-1**, the majority of the pipeline alignment under Alternative 1 would follow existing roads. Installation of pipe along roads would be largely confined to the roadway and road shoulder, but work areas may extend onto adjacent agricultural land. This construction or staging activity may preclude agriculture and require the removal of crops on some portion of adjacent agricultural land under Williamson Act contract, but these impacts would be temporary (lasting for the 1.5-year construction period) and would not affect the status of Williamson Act contracts.

Installation of pipe through agricultural fields would entail clearing and use of a 45-foot-wide construction corridor, and operation of heavy machinery. Crops may have to be removed in this construction corridor and agriculture would be precluded for some portion of the construction period (1.5 years). These construction impacts would be temporary and would not affect the status of the Williamson Act contract(s). Pipe would be installed 8 to 10 feet below-ground and topsoil would be conserved (see **Mitigation Measure AG-1**) and backfilled over installed pipe such that farming could resume following project construction. As a result, Alternative 1 would not conflict with any Williamson Act contracts and there would be no impact.

Separate Alignment Alternative

The Williamson Act contract lands and potential impacts associated with the reach from Modesto WQFC to DMC would be the same for Alternative 2 as those described above for Alternative 1.

As for the reach from the Harding Drain Bypass Pipeline to the DMC, **Figure 3.2-2** shows many parcels under Williamson Act contracts within or adjacent to the proposed pipeline alignment. Parcels adjacent to Pomegranate Avenue between the San Joaquin River and Locust Avenue, and the private road between Locust Avenue and Highway 33, are under Williamson Act contracts. All of the land between Highway 33 and the DMC is also under Williamson Act contract (see **Figure 3.2-2)**.

Potential conflicts with Williamson Act contracts on these lands due to pipeline installation would be the same as described above for Alternative 1. As mentioned above in the discussion for Alternative 1, the land adjacent to the existing Jennings Plant outfall pump station is not under a Williamson Act contract so there would be no potential for conflict from repurposing of the existing Jennings Plant outfall pump station.

Alternative 2 would not conflict with any Williamson Act contracts and there would be no impact.

PID Conveyance Alternative

There are parcels of Williamson Act lands located along Bartch and Ward Avenues, but as noted above construction of pipelines is allowable on Williamson Act lands. The site for the expanded intake and pump station is within PID ROW and would not conflict with a Williamson Act Contract.

No Action Alternative

Under the No Action Alternative, no pipelines or pump station would be installed on Williamson Act contract lands and no potential conflicts with Williamson Act contracts would occur. In addition, no recycled water would be delivered to customers in DPWD's service area for irrigation of farmland. As DPWD is predicted to experience shortfalls in irrigation water supply of 41,000 AFY, the No Action Alternative could potentially affect Williamson Act contracts. There may be increased incentive for landowners in Williamson Act contracts to convert their land to other uses (e.g., real estate developments) and exit contracts if sufficient irrigation water is unavailable. DPWD would be expected to seek alternative sources of irrigation water supply, but such supply may not be available. To the extent that Williamson Act contracts are terminated on parcels that would otherwise remain in such contracts under the proposed project, this impact is considered significant and unavoidable.

Significance Determination

No impact (Alternatives 1, 2, and 3); Significant and unavoidable (No Action Alternative).

Mitigation Measures

No mitigation is necessary for Alternatives 1, 2 and 3. No mitigation is possible for the No Action Alternative.

Impact AG-4 Provide Drought-Resistant Source of Water to Agriculture

The proposed project would provide recycled water produced at the Turlock RWQCF and Modesto Jennings Plant to farmland in DPWD's service area. Volumes of municipal wastewater generation are generally not greatly affected by climate, and as such the proposed project's water supply would be drought-resistant and would generally be available in all years. This impact would be the same under all project alternatives.

Combined and Separate Alignment Alternatives, PID Conveyance Alternative

Under Alternatives 1, 2 and 3, the proposed project would establish a reliable, long-term water supply of up to 59,000 AFY of recycled water for DPWD. Alternatives 1 and 2 would also maximize Project Partners' (DPWD, City of Modesto, and City of Turlock) control over operations and delivery of water and establish a long-term ability to beneficially use recycled water. Agricultural water delivered to DPWD would be at a cost that supports regional economic sustainability.

A need for the project exists as substantial reductions in CVP water allocations to DPWD have occurred since the early 1990s, and are likely to continue to occur in the future. As described in *Chapter 2, Alternatives and Proposed Project/Action* and in the Environmental Setting/Affected Environment section above, DPWD's current supplies are not sufficient to meet demands. It is predicted that future deliveries from the CVP to DPWD will average approximately 49,000 AFY; DPWD's 2013 water demand was estimated at approximately 90,000 AFY, which would result in an anticipated shortfall of 41,000 AFY (see **Figure 1-3**). The proposed project would therefore address the shortage in water supply within DPWD's service area. The proposed project would also offset potential related adverse effects from increased groundwater pumping (e.g., overdraft, subsidence, water quality issues) that have occurred and would likely continue to occur with the absence of an alternative water supply.

The proposed project would meet the needs described above by providing a reliable source of water that would generally be available regardless of Delta pumping restrictions or drought conditions to help meet DPWD's water demands.

By providing a reliable source of water, the proposed project would reduce the potential for future conversions of farmland to non-agricultural use as a result of insufficient water supplies. This is considered to be a benefit.

No Project Alternative

Under this alternative, no recycled water would be provided to DPWD for irrigation of farmland in its service area. In 2014, up to 15,000 acres of agricultural land may go fallow due to lack of availability of surface water and insufficient quantities of groundwater. Without the proposed project, additional farmland may be fallowed, converting this farmland to non-agricultural uses. To the extent that farmland which would otherwise remain in agricultural production under the proposed project would be fallowed under this alternative, this impact is considered significant. DPWD would be expected to seek alternative sources of irrigation water supply, but such supply may not be available, and in these circumstances, additional fallowing of farmland would be unavoidable. Given this situation, impacts of the No Action Alternative are considered significant and unavoidable.

Significance Determination

Beneficial (Alternatives 1, 2 and 3); Significant and unavoidable (No Action Alternative).

Cumulative Impacts

The geographic scope of cumulative impacts on agricultural resources encompasses the study area. Several relevant present and future projects are under construction or in the planning phase that are in proximity to the proposed project facilities and the study area, including:

- Jennings Road Treatment Plant Phase 2 Improvements (City of Modesto); increase tertiary treatment capacity by 12.6 MGD;
- South County Corridor Study (Stanislaus County Council of Governments); study potential alignments and corridor options for an expressway from the City of Turlock on the west to Interstate 5 on the east (Stanislaus County Public Works 2011);
- West Main Street Highway Improvement Project (Stanislaus County); widening of West Main Avenue to 3 lanes from the San Joaquin River to Crows Landing Road (Stanislaus County Public Works 2011).

Of these three projects, the South County Corridor Study and West Main Street Highway Improvement Project would have the potential to adversely affect agricultural resources. If the alignment of the new expressway from the City of Turlock to Interstate-5 ultimately selected for construction through the South County Corridor Study were to pass through existing agricultural land, it could result in conversion of farmland to non-agricultural use. Widening of West Main Street could also result in conversion of farmland to non-agricultural use because the land adjacent to West Main Street between the San Joaquin River and the intersection of West Main Street and Crows Landing Road is predominantly Prime Farmland (CDOC 2012a).

A number of Reclamation projects are also underway or planned for the DMC, but none of these projects would be expected to affect agricultural resources.

Ongoing conversion of farmland to non-agricultural uses is a regional problem in the study area and is considered a cumulatively significant impact. As described in the impact discussions above, the proposed project generally support agriculture and prevent farmland conversion. The proposed project's contribution to this cumulative impact is therefore considered beneficial.

3.2.4 References

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3.3 Air Quality

This section evaluates the potential adverse impacts related to air quality that could result from implementation of the proposed NVRRWP. The analysis is based on a review of current air quality conditions, inventory of the proposed project air emissions, and information from state and local agencies.

3.3.1 Environmental Setting/Affected Environment

This section describes the environmental setting for air quality within the study area, which includes the project site and the San Joaquin Valley Air Basin (SJVAB) where the project is located.

Study Area

The study area consists of the locations where physical actions associated with the proposed project would take place. This is primarily the area near the terminus of the Turlock Harding Drain Bypass Pipeline, the City of Modesto's Jennings Plant, and the land immediately surrounding the proposed pipeline alignments to the DMC. The recycled water would be delivered to farms within the DPWD service area in Stanislaus, San Joaquin and Merced Counties as well as south of Delta-CVPIA designated refuges. This entire study area is within the SJVAB, which is under jurisdiction of the San Joaquin Valley Air Pollution Control District (SJVAPCD).

San Joaquin Valley Air Basin

The California Air Resources Board (CARB) has divided California into regional air basins according to topographic air drainage features. The SJVAB, which is approximately 250 miles long and averages 35 miles wide, is the second largest air basin in the state. The SJVAB is defined by the Sierra Nevada Mountains in the east (8,000 to 14,000 feet in elevation), the Coast Range in the west (averaging 3,000 feet in elevation), and the Tehachapi Mountains in the south (6,000 to 8,000 feet in elevation). The valley is essentially flat with a slight downward gradient to the north-northwest. The valley terminates where the San Joaquin-Sacramento River Delta (Delta) empties into San Francisco Bay. The San Joaquin Valley (SJV), thus, could be considered a "bowl" open only to the north. Although marine air generally flows into the basin from the Delta, the region's topographic features restrict air movement through and out of the basin. The Coast Range hinders wind access into the SJV from the west, the Tehachapi Mountains prevent southerly passage of airflow, and the high Sierra Nevada Mountains are a significant barrier to the east. These topographic features result in weak airflow, which becomes blocked vertically by high barometric pressure over the SJVAB. As a result, the SJVAB is highly susceptible to pollutant accumulation over time. Local climatological effects, including wind speed and direction, temperature, inversion layers, and precipitation and fog, can exacerbate air quality problems in the SJVAB.

Climate and Meteorology

The SJVAB is in a Mediterranean Climate Zone. Mediterranean Climates Zones occur in areas located on the west coast of continents at 30 to 40 degrees latitude and are influenced by a subtropical high-pressure cell most of the year. Mediterranean Climates are characterized by sparse rainfall, which occurs mainly in winter. Summers are hot and dry. Summertime maximum temperatures often exceed 100 degrees Fahrenheit (ºF) in the SJV.

The subtropical high-pressure cell is strongest during spring, summer, and fall and produces subsiding air, which can result in temperature inversions in the valley. A temperature inversion can act like a lid, inhibiting vertical mixing of the air mass at the surface. Any emissions of pollutants can be trapped below the inversion. Most of the surrounding mountains are above the normal height of summer inversions (1,500-3,000 feet).

Winter-time high pressure events can often last many weeks with surface temperatures often lowering into the thirties (Fahrenheit degrees). During these events, fog can be present and inversions are extremely strong. Wintertime inversions can inhibit vertical mixing of pollutants to a few hundred feet.

Wind Speed and Direction

Wind speed and direction play an important role in dispersion and transport of air pollutants. Wind at the surface and aloft can disperse pollution by mixing vertically and by transporting it to other locations. Ozone is classified as a "regional" pollutant in part because of the time required for ozone formation. Ozone precursors can be transported well away from the source area before ozone concentrations peak. Respirable particulate matter (PM_{10}) is also considered a regional pollutant in part because of its tendency to remain suspended in the air over long periods of time. Some other primary pollutants, carbon monoxide (CO) for example, are classified as "localized" pollutants in part because they tend to dissipate easily over long distances, but may form high concentrations close to the source when wind speed is low.

During the summer, wind speed and direction data indicate that wind usually originates at the north end of the SJV and flows in a south-southeasterly direction through the valley, through Tehachapi pass, into the Southeast Desert Air Basin. During the winter, wind speed and direction data indicate that wind occasionally originates from the south end of the SJV and flows in a north-northwesterly direction. Also during the winter months, the SJV experiences light, variable winds, less than 10 mph. Low wind speeds, combined with low inversion layers in the winter, create a climate conducive to high CO and PM_{10} concentrations.

Superimposed on this seasonal regime is the diurnal wind cycle. In the SJV, this cycle takes the form of a combination of sea breeze-land breeze and mountain-valley regimes. The sea breeze-land breeze regime has a sea breeze flowing into the SJV from the north during the day and a land breeze flowing out of the SJV at night. The mountain-valley regime has an upslope (mountain) flow during the day and a downslope (valley) flow at night. These phenomena add to the complexity of regional wind flow and pollutant transport within the SJVAB.

Temperature

Temperature and solar radiation are particularly important in the chemistry of ozone formation. Ozone is formed in a photochemical reaction requiring sunlight. Generally, the higher the temperature, the more ozone formed, since reaction rates increase with temperature. However, extremely hot temperatures can "lift" or "break" the inversion layer. Typically, if the inversion layer does not lift to allow the build-up of contaminants to be dispersed into the Southeast Desert, ozone levels peak in the late afternoon, sometimes as late as 3 to 7 p.m. If the inversion layer breaks and the resultant afternoon winds occur, the ozone will peak in the early afternoon and decrease in the late afternoon as the contaminants are transported to the Southeast Desert. Temperature is not as important to formation of high CO or PM_{10} levels except for the influence of temperature on the inversion layer.

The SJVAB has an "inland Mediterranean" climate, averaging over 260 sunny days per year. The valley floor is characterized by warm, dry summers and cooler winters. Summer high temperatures often exceed 100 ºF, averaging in the low 90s in the northern valley and high 90s in the south. In the entire SJV, high daily temperature readings in summer average 95 ºF. Over the last 30 years, the SJV averaged 106 days a year 90 ºF or hotter, and 40 days a year 100 ºF or hotter. The daily summer temperature variation can be as high as 30 ºF. In winter, as the cyclonic storm track moves southward, the storm systems moving in from the Pacific Ocean bring a maritime influence to the SJV. The high mountains to the east prevent the cold, continental air masses of the interior from influencing the valley. Thus, winters are mild and humid. Temperatures below freezing are unusual. Average high temperatures in the winter are in the 50s, but highs in the 30s and 40s can occur on days with persistent fog and low cloudiness. The average daily low temperature is 45 ºF.

Temperature Inversion

The vertical dispersion of air pollutants in the SJV is limited by the presence of persistent temperature inversions. Because of expansional cooling of the atmosphere, air temperature usually decreases with altitude. A reversal of this atmospheric state, where the air temperature increases with height, is termed an inversion. Inversions can exist at the surface or at any height above the ground. The height of the base of the inversion is known as the "mixing height". This is the level to which pollutants can mix vertically. Semi-permanent systems of high barometric pressure fronts frequently establish themselves over the SJVAB, deflecting low-pressure systems that might otherwise bring cleansing rain and winds.

Air above and below the inversion base does not mix because of differences in air density. Warm air above the inversion is less dense than air below the base. The inversion base represents an abrupt density change where little exchange of air occurs. Inversion layers are an important factor for determining ozone formation and CO and PM_{10} concentrations. Ozone and its precursors will mix and react to produce higher concentrations under an inversion, and inversions trap and hold directly emitted pollutants like CO. Two principal types of inversions occur in the SJV: a surface or radiation inversion, and a subsidence inversion.

Surface inversions are formed when the ground surface becomes cooler than the air above it during the night. The earth's surface goes through a radiative process on clear nights, where heat energy is transferred from the ground to a cooler night sky. As the earth's surface cools during the evening hours, the air directly above it also cools, while air higher up remains relatively warm. The inversion is destroyed when heat from the sun warms the ground, which in turn heats the lower layers of air and stimulates the ground-level air to float up through the inversion layer. Daytime temperature inversions during the summer are usually encountered 2,000 to 2,500 feet above the valley floor. Inversions are more persistent (stable) during the winter months. The daily cycle has overnight inversions occurring 500 to 1,000 feet above the valley floor. Studies in the southern part of the Valley indicate more frequent and persistent daytime radiation inversions than in the north due to the lack of marine air intrusion.

Subsidence inversions occur as air is pushed downward by some mechanism, such as the movement of air over mountain ranges, or by differential pressure changes in the atmosphere. As this air moves downward, its pressure increases, causing its temperature to increase. The warm layer of air created by this phenomenon will descend to some relatively static elevation above the ground, creating a low inversion layer. This type of inversion is quite persistent, since heat from the ground does not reach the inversion base to break it up. This is common in high-pressure areas along the coast.

Precipitation and Fog

Precipitation and fog tend to reduce or limit some pollutant concentrations. Ozone needs sunlight for its formation, and clouds and fog block the required radiation. CO is slightly water-soluble, so precipitation and fog tends to reduce CO concentrations in the atmosphere. PM_{10} is also somewhat "washed" from the atmosphere with precipitation.

Precipitation in the SJV is strongly influenced by the position of the semi-permanent subtropical high-pressure belt located off the Pacific coast (Pacific High). In the winter, this high-pressure system moves southward, allowing Pacific storms to move through the SJV. These storms bring in moist, maritime air that produces considerable precipitation on the western, upslope side of the Coast Range. Significant precipitation also occurs on the western side of the Sierra Nevada Mountains. On the valley floor, however, there is some downslope flow from the Coast Range and the resultant evaporation of moisture from associated warming results in a minimum of precipitation. Nevertheless, the majority of the precipitation falling in the SJVAB is produced by storms during the winter. Precipitation during the summer months is in the form of convective rain showers and is rare. It is usually associated with an influx of moisture into the SJVAB through the San Francisco area during an anomalous flow pattern in

the lower layers of the atmosphere. Although the hourly rates of precipitation from these storms may be high, their rarity keeps monthly totals low.

Precipitation on the SJVAB floor and in the Sierra Nevada decreases from north to south. Stockton in the north receives about 20 inches of precipitation per year, Fresno in the center, receives about 10 inches per year, and Bakersfield at the southern end of the valley receives less than 6 inches per year. This is primarily because the Pacific storm track often passes through the northern part of the state while the southern part of the state remains protected by the Pacific High. Precipitation in the SJVAB is confined primarily to the winter months with some also occurring in late summer and fall. Average annual rainfall for the entire SJV is 9.25 inches on the SJV floor.

Snowstorms, hailstorms, and icestorms occur infrequently in the SJVAB and severe occurrences of any of these are very rare. The winds and unstable air conditions experienced during the passage of storms result in periods of low pollutant concentrations and excellent visibility. Between winter storms, high pressure and light winds allow cold moist air to pool on the SJVAB floor. This creates strong low-level temperature inversions and very stable air conditions. This situation leads to the SJVAB's famous Tule Fogs. The formation of natural fog is caused by local cooling of the atmosphere until it is saturated (dew point temperature). This type of fog, known as radiation fog, is more likely to occur inland. Cooling may also be accomplished by heat radiation losses or by horizontal movement of a mass of air over a colder surface. This second type of fog, known as advection fog, generally occurs along the coast.

Conditions favorable to fog formation are also conditions favorable to high concentrations of CO and PM_{10}. Ozone levels are low during these periods because of the lack of sunlight to drive the photochemical reaction. Maximum CO concentrations tend to occur on clear, cold nights when a strong surface inversion is present and large numbers of fireplaces are in use. A secondary peak in CO concentrations occurs during morning commute hours when a large number of motorists are on the road and the surface inversion has not yet broken.

The water droplets in fog, however, can act as a sink for CO and nitrogen oxides (NO_x), lowering pollutant concentrations. At the same time, fog may help in the formation of secondary particulates such as ammonium sulfate. These secondary particulates are believed to be a significant contributor of winter season violations of the PM_{10} and $PM_{2.5}$ standards.

Air Pollutants

Carbon Monoxide (CO)

CO is an odorless, colorless gas that is highly toxic. CO is formed by the incomplete combustion of fuels and is emitted directly into the air. Ambient CO concentrations normally are considered a local effect and typically correspond closely to the spatial and temporal distributions of vehicular traffic. CO concentrations are also influenced by wind speed and atmospheric mixing. Under inversion conditions, carbon monoxide concentrations may be distributed more uniformly over an area to some distance from vehicular sources. CO binds with hemoglobin, the oxygen-carrying protein in blood, and reduces the blood's capacity for carrying oxygen to the heart, brain, and other parts of the body. At high concentrations, CO can cause heart difficulties in people with chronic diseases, can impair mental abilities, and can cause death.

Ozone

Ozone (O_3) is a reactive gas consisting of three oxygen atoms. In the troposphere (the lowest region of the atmosphere), it is a product of the photochemical process involving the sun's energy. It is a secondary pollutant that is formed when NO_x and volatile organic compounds (VOC) react in the presence of sunlight. Ozone at the earth's surface causes numerous adverse health effects and is a criteria pollutant. It is a major component of smog. In the stratosphere, ozone exists naturally and shields the Earth from harmful incoming ultraviolet radiation. High concentrations of ground level ozone can adversely affect

the human respiratory system and aggravate cardiovascular disease and many respiratory ailments. Ozone also damages natural ecosystems such as forests and foothill communities, agricultural crops, and some man-made materials such as rubber, paint, and plastics.

Oxides of Nitrogen (NO_x)

NO_x are a family of gaseous nitrogen compounds and are precursors to the formation of ozone and particulate matter. The major component of NO_x, nitrogen dioxide (NO_2) is a reddish-brown gas that is toxic at high concentrations. NO_x results primarily from the combustion of fossil fuels under high temperature and pressure. On-road and off-road motor vehicles and fuel combustion are the major sources of this air pollutant.

Volatile Organic Compounds (VOC)

VOCs are hydrocarbon compounds that exist in the ambient air. VOCs contribute to the formation of smog and/or may themselves be toxic. VOC emissions are a major precursor to the formation of ozone.

Particulate Matter (PM)

PM is a complex mixture of extremely small particles and liquid droplets. PM is made up of a number of components including acids, organic chemicals, metals, and soil or dust particles. The size of particles is directly linked to the potential for causing health problems. PM particles that are smaller than 10 micrometers in diameter are of most concern because these particles pass through the throat and nose and enter the lungs. Once inhaled, these particles can affect the heart and lungs and cause serious health effects. These inhalable coarse particles, called $PM_{10,}$ are typically found near roadways and dusty industries. PM_{10} particles are deposited in the thoracic region of the lungs. Fine particles, called $PM_{2.5}$, are particles less than 2.5 micrometers in diameter and are found in smoke and haze. $PM_{2.5}$ particles penetrate deeply into the thoracic and alveolar regions of the lungs.

Sulfur Dioxide (SO_2)

Sulfur dioxide is a colorless, irritating gas with a “rotten egg” smell formed primarily by the combustion of sulfur-containing fossil fuels. Suspended SO_2 particles contribute to the poor visibility that occurs in the SJVAB and are a component of PM_{10}.

Lead

Lead (Pb) is a metal that is a natural constituent of air, water, and the biosphere. Lead is neither created nor destroyed in the environment, so it essentially persists forever. The health effects of lead poisoning include loss of appetite, weakness, apathy, and miscarriage. Lead poisoning can also cause lesions of the neuromuscular system, circulatory system, brain and gastrointestinal tract.

Gasoline-powered automobile engines were a major source of airborne lead through the use of leaded fuels. The use of leaded fuel has been mostly phased out, with the result that ambient concentrations of lead have dropped dramatically. Lead concentrations were last systematically measured in the SJVAB in 1989, when the average concentrations were approximately five percent of the State lead standard. Though monitoring was discontinued in 1990, lead levels are probably well below applicable standards, and the SJVAB is designated as attainment for lead.

Hydrogen Sulfide

Hydrogen Sulfide (H_2S) is associated with geothermal activity, oil and gas production, refining, sewage treatment plants, and confined animal feeding operations. H_2S is extremely hazardous in high concentrations and can cause death.

Sulfates

Sulfates are the fully oxidized ionic form of sulfur. Sulfates occur in combination with metal and/or hydrogen ions. In California, emissions of sulfur compounds occur primarily from the combustion of petroleum-derived fuels (e.g., gasoline and diesel fuel) that contain sulfur. This sulfur is oxidized to sulfur dioxide (SO_2) during the combustion process and subsequently converted to sulfate compounds in the atmosphere. The conversion of SO_2 to sulfates takes place comparatively rapidly and completely in urban areas of California due to regional meteorological features.

CARB's sulfate standard is designed to prevent aggravation of respiratory symptoms. Effects of sulfate exposure at levels above the standard include a decrease in ventilatory function, aggravation of asthmatic symptoms, and an increased risk of cardio-pulmonary disease. Sulfates are particularly effective in degrading visibility, and, due to the fact that they are usually acidic, can harm ecosystems and damage materials and property. Data collected in the SJVAB demonstrate levels of sulfates significantly less than the health standards.

Vinyl Chloride

Vinyl chloride is a colorless gas that does not occur naturally. It is formed when other substances such as trichloroethane, trichloroethylene, and tetrachloroethylene are broken down. Vinyl chloride is used to make polyvinyl chloride (PVC) which is used to make a variety of plastic products, including pipes, wire and cable coatings, and packaging materials.

Toxic Air Contaminants (TAC)

TACs are air pollutants that may lead to serious illness or increased mortality, even when present in relatively low concentrations. Hundreds of different types of TACs exist, with varying degrees of toxicity. Many TACs are confirmed or suspected carcinogens, or are known or suspected to cause birth defects or neurological damage. For some chemicals, such as carcinogens, no thresholds exist below which exposure can be considered risk-free. Examples of TAC sources in the proposed project include fossil fuel combustion sources.

Sources of TACs include stationary sources, area-wide sources, and mobile sources. EPA maintains a list of 187 TACs, also known as hazardous air pollutants. These hazardous air pollutants are included on CARBs list of TACs (CARB 2013c). According to the California Almanac of Emissions and Air Quality (CARB 2013b), many researchers consider diesel PM (DPM) to be a primary contributor to health risk from TACs because particles in the exhaust carry many harmful organics and metals, rather than being a single substance as are other TACs. Unlike many TACs, outdoor DPM is not monitored by CARB because no routine measurement method exists. However, using the CARB emission inventory's PM_{10} database, ambient PM_{10} monitoring data, and results from several studies, CARB has made preliminary estimates of DPM concentrations throughout the state (OEHHA 2001).

Air Quality Attainment and Local Conditions

The CARB and the Federal Environmental Protection Agency (EPA) have established Ambient Air Quality Standards in an effort to protect human health and welfare. Geographic areas are deemed to be in "attainment" if these standards are met or "nonattainment" if they are not met. Nonattainment status is classified by the severity of the nonattainment problem, with marginal, moderate, serious, severe, and extreme nonattainment classifications for ozone. Nonattainment classifications for PM range from marginal to serious. **Table 3.3-1** shows the attainment status for the SJVAB.

Table 3.3-1: San Joaquin Valley Attainment Status

Pollutant	Designation/Classification	
	Federal Standards	State Standards
Ozone-1 hour	No Federal Standard[1]	Nonattainment/Severe
Ozone-8 hour	Nonattainment/Extreme	Nonattainment
PM_{10}	Attainment	Nonattainment
$PM_{2.5}$	Nonattainment	Nonattainment
Carbon Monoxide	Attainment/Unclassified	Attainment/Unclassified
Nitrogen Dioxide	Attainment/Unclassified	Attainment
Sulfur Dioxide	Attainment/Unclassified	Attainment
Lead	No Designation/Classification	Attainment
Hydrogen Sulfide	No Federal Standard	Unclassified
Sulfates	No Federal Standard	Attainment
Visibility Reducing Particles	No Federal Standard	Unclassified
Vinyl Chloride	No Federal Standard	Attainment

Notes: 1. Effective June 15, 2005, the U.S. Environmental Protection Agency (EPA) revoked the federal 1-hour ozone standard, including associated designations and classifications. EPA had previously classified the SJVAB as extreme nonattainment for this standard. EPA approved the 2004 Extreme Ozone Attainment Demonstration Plan on March 8, 2010 (effective April 7, 2010). Many applicable requirements for extreme 1-hour ozone nonattainment areas continue to apply to the SJVAB.

Source: SJVAPCD 2014a

Air Monitoring Data

The SJVAPCD, CARB, and EPA operate an extensive air monitoring network to measure progress toward attainment of the National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS). The closest air monitoring stations located near the project area are the Modesto 14th Street and Turlock South Minaret Street monitoring stations. **Table 3.3-2** shows the most recent three years of data that is available.

Table 3.3-2: Air Monitoring Data for 2011-2013

Site	Pollutant Standard		2013			2012			2011		
			# Exceed	Maximum Concentration		# Exceed	Maximum Concentration		# Exceed	Maximum Concentration	
Modesto 14th Street	Ozone	State 1-hour	0	0.088	ppm	2	0.104	ppm	0	0.091	ppm
Turlock South Minaret Street	Ozone	State 1-hour	1	0.095	ppm	17	0.115	ppm	4	0.111	ppm
Modesto 14th Street	Ozone	State 8-hour	13	0.082	ppm	12	0.091	ppm	7	0.078	ppm
Turlock South Minaret Street	Ozone	State 8-hour	24	0.085	ppm	56	0.107	ppm	34	0.094	ppm
Modesto 14th Street	Ozone	National 8-hour	2	0.082	ppm	6	0.091	ppm	3	0.078	ppm
Turlock	Ozone	National 8-hour	14	0.084	ppm	35	0.106	ppm	17	0.093	ppm

Site	Pollutant	Standard	2013 # Exceed	2013 Maximum Concentration		2012 # Exceed	2012 Maximum Concentration		2011 # Exceed	2011 Maximum Concentration	
South Minaret Street											
Modesto 14th Street	$PM_{2.5}$	National 24-hour	37.6	83.2	$\mu g/m^3$	13	62.3	$\mu g/m^3$	25	71.7	$\mu g/m^3$
Turlock South Minaret Street	$PM_{2.5}$	National 24-hour	40.3	74.9	$\mu g/m^3$	25	58.4	$\mu g/m^3$	36.3	77.9	$\mu g/m^3$
Modesto 14th Street	$PM_{2.5}$	State Annual		14.3	$\mu g/m^3$		11.9	$\mu g/m^3$		14.6	$\mu g/m^3$
Turlock South Minaret Street	$PM_{2.5}$	State Annual		15.1	$\mu g/m^3$		14.8	$\mu g/m^3$		17.1	$\mu g/m^3$
Modesto 14th Street	$PM_{2.5}$	National Annual		14.3	$\mu g/m^3$		11.9	$\mu g/m^3$		14.6	$\mu g/m^3$
Turlock South Minaret Street	$PM_{2.5}$	National Annual		15.1	$\mu g/m^3$		14.8	$\mu g/m^3$		17.1	$\mu g/m^3$
Modesto 14th Street	PM_{10}	State 24-hour	57.7	77.5	$\mu g/m^3$	30.9	74.6	$\mu g/m^3$	ND	73.5	$\mu g/m^3$
Turlock South Minaret Street	PM_{10}	State 24-hour	73.7	82.9	$\mu g/m^3$	54.8	103.8	$\mu g/m^3$	ND	73.3	$\mu g/m^3$
Modesto 14th Street	PM_{10}	National 24-hour	0	73	$\mu g/m^3$	0	74.1	$\mu g/m^3$	0	6934	$\mu g/m^3$
Turlock South Minaret Street	PM_{10}	National 24-hour	0	79.2	$\mu g/m^3$	0	102.8	$\mu g/m^3$	0	69	$\mu g/m^3$
Modesto 14th Street	PM_{10}	State Annual		30.9	$\mu g/m^3$		25.6	$\mu g/m^3$		ND	$\mu g/m^3$
Turlock South Minaret Street	PM_{10}	State Annual		35.9	$\mu g/m^3$		31	$\mu g/m^3$		ND	$\mu g/m^3$
Modesto 14th Street	CO	State 1-hour	0	2.8	ppm	0	2.6	ppm	0	2.9	ppm
Turlock South Minaret Street	CO	State 1-hour	0	1.9	ppm	0	2.1	ppm	0	2	ppm
Modesto 14th Street	CO	State 8-hour	0	ND	ppm	0	2.1	ppm	0	2.71	ppm
Turlock South	CO	State	0	ND	ppm	0	1.29	ppm	0	1.44	ppm

Site	Pollutant	Standard	2013 # Exceed	2013 Maximum Concentration		2012 # Exceed	2012 Maximum Concentration		2011 # Exceed	2011 Maximum Concentration	
Minaret Street		8-hour									
Modesto 14th Street	CO	National 8-hour	0	ND	ppm	0	2.1	ppm	0	2.71	ppm
Turlock South Minaret Street	CO	National 8-hour	0	ND	ppm	0	1.29	ppm	0	1.44	ppm
Turlock South Minaret Street	NO2	State 1-hour	0	54	ppb	0	61	ppb	0	54	ppb
Turlock South Minaret Street	NO2	National 1-hour	0	54	ppb	0	61	ppb	0	54	ppb

Source: CARB 2014 iADAM and CARB 2014 AQMIS2

3.3.2 Regulatory Framework

This section describes laws and regulations at the federal, state, and local level that may apply to the project.

Federal Policies and Regulations

The EPA is responsible for establishing the NAAQS, enforcing the Federal Clean Air Act (CAA), and regulating transportation-related emission sources, such as aircraft, ships, and certain types of locomotives, under the exclusive authority of the federal government. The EPA also establishes vehicular emission standards, including those for vehicles sold in states other than California. Automobiles sold in California must meet stricter emission standards established by CARB.

Clean Air Act

The CAA governs air quality in the United States and is administered by the EPA. The EPA is responsible for setting and enforcing the NAAQS for atmospheric pollutants, which are presented in **Table 3.3-3**. It regulates emission sources that are under the exclusive authority of the federal government, such as aircraft, ships, and certain locomotives. The EPA also has jurisdiction over emission sources outside state waters (outer continental shelf), and establishes various emissions standards for vehicles sold in states other than California. As part of its enforcement responsibilities, the EPA requires each state with nonattainment areas to prepare and submit a State Implementation Plan (SIP) that demonstrates the means to attain the federal standards. The SIP must integrate federal, state, and local plan components and regulations to identify specific measures to reduce pollution, using a combination of performance standards and market-based programs within the timeframe identified in the SIP.

Table 3.3-3: State and Federal Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards [1]		National Standards [2]		
		Concentration [3]	Method [4]	Primary [3,5]	Secondary [3,6]	Method [7]
Ozone (O_3)	1 Hour	0.09 ppm (180 µg/m^3)	Ultraviolet Photometry	—	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.070 ppm (137 µg/m^3)		0.075 ppm (147 µg/m^3)		
Respirable Particulate Matter (PM_{10})	24 Hour	50 µg/m^3	Gravimetric or Beta Attenuation	150 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m^3		—		
Fine Particulate Matter ($PM_{2.5}$)[13]	24 Hour	—	—	35 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m^3	Gravimetric or Beta Attenuation	12 µg/m^3	15 µg/m^3	
Carbon Monoxide (CO)	1 Hour	20 ppm (23 mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	35 ppm (40 mg/m^3)	—	Non-Dispersive Infrared Photometry (NDIR)
	8 Hour	9.0 ppm (10 mg/m^3)		9 ppm (10 mg/m^3)	—	
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		—	—	
Nitrogen Dioxide (NO_2)[8]	1 Hour	0.18 ppm (339 µg/m^3)	Gas Phase Chemilum-inescence	100 ppb (188 µg/m^3)	—	Gas Phase Chemilum-inescence
	Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)		0.053 ppm (100 µg/m^3)	Same as Primary Standard	
Sulfur Dioxide (SO_2)	1-hour	0.25 ppm (655 µg/m^3)	Ultraviolet Fluorescence	75 ppb (196 µg/m^3)	—	Ultraviolet Fluorescence ; Spectro-photometry (Pararosaniline Method)
	3-hour	—		—	0.5 ppm (1300 µg/m^3)	
	24-hour	0.04 ppm (105 µg/m^3)		0.14 ppm (for certain areas)[9]	—	
	Annual Arithmetic Mean	—		0.030 ppm (for certain areas)[9]	—	

Pollutant	Averaging Time	California Standards [1]		National Standards [2]		
		Concentration [3]	Method [4]	Primary [3,5]	Secondary [3,6]	Method [7]
Lead[10],[11]	30-day average	1.5 µg/m^3	Atomic Absorption	—	—	High Volume Sampler and Atomic Absorption
	Calendar quarter	—		1.5 µg/m^3 (for certain areas)[11]	Same as Primary Standard	
	Rolling 3-month average	—		0.15 µg/m^3		
Visibility Reducing Particles[12]	8-hour	See footnote 12	Beta Attenuation and Transmittance through Filter Tape	No National Standards		
Sulfates	24-hour	25 µg/m^3	Ion Chromatography			
Hydrogen Sulfide	1-hour	0.03 ppm (42 µg/m^3)	Ultraviolet Fluorescence			
Vinyl Chloride[10]	24-hour	0.01 ppm (26 µg/m^3)	Gas Chromatography			

Notes: ppm = parts per million; ppb = parts per billion; µg/m3 = micrograms per cubic meter

1. California standards for O_3, CO (except 8-hour Lake Tahoe), SO_2 (1 and 24 hour), NO_2, and particulate matter (PM_{10}, $PM_{2.5}$, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200, Title 17 of the California Code of Regulations.

2. National standards (other than O_3, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The O_3 standard is attained when the fourth highest 8-hour concentration measured at each site in 1 year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m3 is equal to or less than 1. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact EPA for further clarification and current national policies.

3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based on a reference temperature of 25 degrees Celsius (°C) (77 ºF) and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

4. Any equivalent measurement method which can be shown to the satisfaction of CARB to give equivalent results at or near the level of the air quality standard may be used.

5. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

6. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

7. Reference method as described by EPA. An “equivalent method” of measurement may be used but must have a “consistent relationship to the reference method” and must be approved by EPA.

8. To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the national 1-hour standard is in ppb. California standards are in ppm. To directly compare the national 1-hour standard to the California standards the units can be converted from ppb to ppm. In

Pollutant	Averaging Time	California Standards [1]		National Standards [2]		
		Concentration [3]	Method [4]	Primary [3,5]	Secondary [3,6]	Method [7]

this case, the national standard of 100 ppb is identical to 0.100 ppm.

9. On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

Note that the 1-hour national standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the 1-hour national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.

10. CARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

11. The national standard for lead was revised on October 15, 2008 to a rolling 3-month average. The 1978 lead standard (1.5 µg/m3 as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

12. In 1989, CARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

13. In On December 14, 2012, the national annual $PM_{2.5}$ primary standard was lowered from 15.0 µg/m3 to 12.0 µg/m3. The existing national 24-hour $PM_{2.5}$ standards (primary and secondary) were retained at 35 µg/m3, as was the annual secondary standard of 15 µg/m3. The existing 24-hour PM_{10} standards (primary and secondary) of 150 µg/m3 also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.

Source: CARB 2013a

Clean Air Act and Conformity Rule

Pursuant to CAA Section 176(c) requirements, EPA promulgated Title 40 Code of Federal Regulations Part 51 (40 CFR Part 51), Subpart W and 40 CFR Part 93, Subpart B, "Determining Conformity of General Federal Actions to State or Federal Implementation Plans" (see 58 Federal Register [Fed. Reg.] 63214, [November 30, 1993], as amended; 75 Fed. Reg. 17253 [April 5, 2010]). These regulations, commonly referred to as the General Conformity Rule, apply to all federal actions including those by U.S. Bureau of Reclamation, except for those federal actions which are excluded from review (e.g., stationary source emissions) or related to transportation plans, programs, and projects under Title 23 U.S. Code or the Federal Transit Act, which are subject to Transportation Conformity.

In states that have an approved SIP revision adopting General Conformity regulations, 40 CFR Part 51, Subpart W, applies; in states that do not have an approved SIP revision adopting General Conformity regulations, 40 CFR Part 93, Subpart B, applies.

The General Conformity Rule is used to determine if federal actions meet the requirements of the CAA and the applicable SIP by ensuring that air emissions related to the action do not:

- Cause or contribute to new violations of a NAAQS.
- Increase the frequency or severity of any existing violation of a NAAQS.
- Delay timely attainment of a NAAQS or interim emission reduction.

A conformity determination under the General Conformity Rule is required if the federal agency determines the following: the action will occur in a nonattainment or maintenance area; that one or more specific exemptions do not apply to the action; the action is not included in the federal agency's "presumed to conform" list; the emissions from the proposed action are not within the approved emissions budget for an applicable facility; and the total direct and indirect emissions of a pollutant (or its

precursors) are at or above the *de minimis* levels established in the General Conformity regulations (75 Fed. Reg. 17255). The *de minimis* levels are shown in **Table 3.3-4**.

Table 3.3-4: General Conformity *De Minimis* Levels

Pollutant	Area Type	Tons/Year
Ozone (VOC or NO_x)	Serious nonattainment	50
	Severe nonattainment	25
	Extreme nonattainment	**10**
	Other areas outside an ozone transport region	100
Ozone (NO_x)	Marginal and moderate nonattainment inside an ozone transport region	100
	Maintenance	100
Ozone (VOC)	Marginal and moderate nonattainment inside an ozone transport region	50
	Maintenance within an ozone transport region	50
	Maintenance outside an ozone transport region	100
Carbon monoxide, SO_2 and NO_2	**All nonattainment & maintenance**	**100**
PM_{10}	Serious nonattainment	70
	Moderate nonattainment and maintenance	**100**
$PM_{2.5}$ Direct emissions, SO_2, NO_x (unless determined not to be a significant precursor), VOC or ammonia (if determined to be significant precursors)	**All nonattainment & maintenance**	**100**
Lead (Pb)	**All nonattainment & maintenance**	**25**

Source: EPA 2014.

Conformity regulatory criteria are listed in 40 CFR Part 93.158. An action will be determined to conform to the applicable SIP if, for each pollutant that exceeds the *de minimis* emissions level in 40 CFR Part 93.153(b), or otherwise requires a conformity determination due to the total of direct and indirect emissions from the action, the action meets the requirements of 40 CFR Part 93.158(c). If on-site emissions reductions do not decrease emissions below the *de minimis* emissions level, then emissions must be off-set to zero for ozone precursors through a combination of on-site and off-site mitigation.

In addition, federal activities may not cause or contribute to new violations of air quality standards, exacerbate existing violations, or interfere with timely attainment or required interim emissions reductions toward attainment. The proposed project is subject to review under the EPA General Conformity Rule. Since the area is classified as extreme nonattainment for ozone, the applicable *de*

minimis level is 10 tons per year of NO_x or VOC. For CO, SO_2, NO_2, PM_{10}, and $PM_{2.5}$ the applicable level is 100 tons per year. The level for lead is 25 tons per year.

Corporate Average Fuel Economy Standards

The Corporate Average Fuel Economy (CAFE) standards were first enacted by Congress in 1975, requiring vehicle manufacturers to comply with the gas mileage or fuel economy standards. These standards are set and regulated by the National Highway Traffic Safety Administration (NHTSA), with testing and data support from EPA.

The issued rules include fuel economy standards for both light- and heavy-duty vehicles. On September 15, 2011, EPA and NHTSA issued a final rule on greenhouse gas (GHG) emissions standards and fuel efficiency standards for medium- and heavy-duty engines and vehicles model years 2014 to 2018 (76 FR 57106). On August 28, 2012, EPA and NHTSA issued a joint final rulemaking to establish 2017 through 2025 GHG emissions and CAFE standards for light-duty vehicles (77 FR 62624). More fuel efficient vehicles result in lower air pollutant emissions.

Nonroad Emission Regulations

EPA has adopted emissions standards for different types of nonroad engines, equipment, and vehicles. For nonroad diesel engines, EPA has adopted multiple tiers of emission standards.

EPA signed a final rule on May 11, 2004 introducing the Tier 4 emission standards, to be phased in between 2008 and 2015 (69 CFR 38957–39273, June 29, 2004). The Tier 4 standards require that emissions of PM and NO_x be further reduced by about 90 percent. Such emission reductions can be achieved through the use of control technologies, including advanced exhaust gas after-treatment. To enable sulfur-sensitive control technologies in Tier 4 engines, such as catalytic particulate filters and NO_x absorbers, EPA also mandated reductions in sulfur content in nonroad diesel fuels. In most cases, federal nonroad regulations also apply in California, which has only limited authority to set emission standards for new nonroad engines. The CAA preempts California's authority to control emissions from new farm and construction equipment under 175 horsepower (CAA Section 209[e][1][A]) and requires California to receive authorization from EPA for controls over other off-road sources (CAA Section 209[e][2][A]).

State Regulations and Policies

California Environmental Protection Agency

The California Environmental Protection Agency (Cal-EPA) is a state agency that includes CARB, the State Water Resources Control Board, nine Regional Water Quality Control Boards, the Integrated Waste Management Board, the Department of Toxic Substances Control, the Office of Environmental Health Hazard Assessment, and the Department of Pesticide Regulation. The mission of Cal-EPA is to restore, protect, and enhance the environment and to ensure public health, environmental quality, and economic vitality.

California Clean Air Act

The California Clean Air Act (CCAA) requires nonattainment areas to achieve and maintain the health-based State Ambient Air Quality Standards by the earliest practicable date. The Act is administered by CARB at the state level and by local air quality management districts at the regional level, whereby the air districts are required to develop plans and control programs for attaining the state standards. **Table 3.3-3** above shows the CAAQS.

CARB is responsible for ensuring implementation of the CCAA, meeting state requirements of the federal CAA, and establishing the CAAQS. It is also responsible for setting emission standards for vehicles sold in California and for other emission sources, such as consumer products and certain off-road equipment. CARB also establishes passenger vehicle fuel specifications.

In-Use Off-Road Diesel Vehicle Regulation

In 2007, CARB adopted a regulation to reduce diesel particulate matter and NO_x emissions from in-use off-road heavy-duty diesel vehicles in California. The regulation imposes limits on vehicle idling and requires fleets to reduce emissions by retiring, replacing, repowering, or installing exhaust retrofits to older engines. In December 2010, major amendments were made to the regulation, including a delay of the first performance standards compliance date to no earlier than January 1, 2014.

Truck and Bus Regulation

On December 12, 2008, CARB approved a new regulation to substantially reduce emissions of DPM, NO_x, and other pollutants from existing on-road diesel vehicles operating in California. The regulation requires affected trucks and buses to meet performance standards and requirements between 2011 and 2023. Affected vehicles included on-road, heavy-duty, diesel-fueled vehicles with a gross vehicle weight rating great than 14,000 pounds. The regulation was updated in 2011, with revisions that provide more compliance flexibility and reflect the impact of the economic recession on vehicle activity and emissions. Heavy-duty trucks used in proposed project activities would have to comply with this regulation.

Commercial Vehicle Idling Regulation

On October 20, 2005, CARB approved the Airborne Toxic Control Measure (ACTM) to limit diesel-fuel commercial motor vehicle idling. This regulation was a follow-up to previous idling ATCMs, and it consists of new engine and in-use truck requirements, as well as idling emission performance standards. The regulation requires 2008 and newer model year heavy-duty diesel engines to be equipped with a nonprogrammable engine shutdown system that automatically shuts down the engine after 5 minutes of idling or optionally meets a stringent NO_x idling emission standard (i.e., 30 grams/hour). The regulation also is applicable to the operation of in-use trucks, requiring operators of both in-state and out-of-state registered, sleeper berth-equipped trucks to manually shut down their engine when idling more than 5 minutes at any location within California, beginning in 2008. Affected vehicles include diesel-fueled commercial vehicles with a gross vehicle weight rating greater than 10,000 pounds. Trucks used for vendor delivery of materials for proposed project activities would comply with the commercial vehicle idling regulatory requirements.

Heavy-Duty On-Board Diagnostic System Regulations

In 2004, CARB adopted a regulation requiring on-board diagnostic systems (OBD) on all 2007 and later model year heavy-duty engines used in vehicles with a gross vehicle weight rating greater than 14,000 pounds in California. CARB subsequently adopted a comprehensive on-board diagnostic regulation for heavy-duty vehicles model years 2010 and beyond. The heavy-duty OBD regulation was updated in 2010 and 2013, with revisions to enforcement requirements, testing requirements, and implementation schedules. Heavy-duty trucks used for proposed project activities would comply with the heavy-duty on-board diagnostic regulatory requirements.

Heavy-Duty Vehicle Inspection Program

This program requires for heavy-duty trucks and buses to be inspected for excessive smoke and tampering, and engine certification label compliance. Any heavy-duty vehicle (i.e., vehicles with a gross vehicle weight rating greater than 6,000 pounds) traveling in California, including vehicles registered in other states and foreign countries, may be tested. Tests are performed by CARB inspection teams at border crossings, California Highway Patrol weigh stations, fleet facilities, and randomly selected roadside locations. Owners of trucks and buses found in violation are subject to minimum penalties, starting at $300 per violation. Heavy-duty trucks used for proposed project activities would be subject to the inspection program.

California Standards for Diesel Fuel Regulations

These regulations require diesel fuel with sulfur content of 15 parts per million (ppm) or lower (by weight) to be used for all diesel-fueled vehicles that are operated in California. The standard also applies to non-vehicular diesel fuel, other than diesel fuel used solely in locomotives or marine vessels. The regulations also contain standards for the aromatic hydrocarbon content and lubricity of diesel fuels.

State Portable Engine Airborne Toxic Control Measure

The California Portable Engine ATCM is designed to reduce the PM emissions from portable diesel-fueled engines rated at 50 brake horsepower or larger. Because backpack sprayer engines are assumed to be electric or gas-powered and vehicle-mounted pump engines, such as dewatering pumps, are assumed to be smaller than 50 brake horsepower, they are exempt from the State Portable Engine ATCM. No other portable engines are expected to be used under the proposed project.

Portable Equipment Registration Program

The statewide Portable Equipment Registration Program establishes a system to uniformly regulate portable engines and portable engine-driven equipment units. After being registered in this program, engines and equipment units may operate throughout the state without the need to obtain individual permits from air districts. Owners or operators of portable engines and certain types of equipment can voluntarily register their units under this program, to operate their equipment anywhere in the state. Operation of registered portable engines still may be subject to certain district requirements for reporting and notification. Engines with less than 50 brake horsepower are exempt from this program; therefore, some of the engines used for the proposed project would be exempt.

Senate Bill (SB) 709

SB 709 amends the Health and Safety Code to give the SJVAPCD more responsibility in terms of permitting, fee implementation, and agricultural assistance, as well as the authority to require the use of Best Available Control Technology (BACT) for existing emission sources, promote cleaner-burning alternative fuels, and encourage and facilitate ridesharing. SB 709 also amends the Vehicle Code to allow the SJVAPCD to adopt a surcharge on motor vehicle registration fees.

Regional Regulations and Policies

San Joaquin Valley Air Pollution Control District

The SJVAPCD is responsible for (1) implementing air quality regulations, including developing plans and control measures for stationary sources of air pollution to meet the NAAQS and CAAQS, (2) implementing permit programs for the construction, modification, and operation of sources of air pollution, and (3) enforcing air pollution statutes and regulations governing stationary sources. With CARB oversight, the SJVAPCD administers local regulations.

The SJVAPCD also coordinates transportation and air quality planning activities with the eight San Joaquin Valley transportation planning agencies. The SJVAPCD and the transportation planning agencies coordinate on mobile emissions inventory development, transportation control measure development and implementation, and transportation conformity issues.

The SJVAPCD has implemented several regulations and rules that are relevant to the proposed action described below.

SJVAPCD Rule 2201, New and Modified Stationary Source Review

Rule 2201 applies to new or modified stationary sources and requires that sources not increase emissions above the specified thresholds. If the post-project stationary source potential to emit equals or exceeds the offset threshold levels, offsets will be required. New emergency generators at the pump stations would need to be permitted by the SJVAPCD and would have to comply with BACT requirements

SJVAPCD Rule 2280, Portable Equipment Registration

Portable equipment used at project sites for less than 6 consecutive months must be registered with SJVAPCD. The district will issue the registrations 30 days after the receipt of the application.

SJVAPCD Rule 4201 and Rule 4202, Particulate Matter Concentration and Emission Rates

Rule 4201 and Rule 4202 apply to operations that emit or may emit dust, fumes, or total suspended particulate matter. Particulate emissions from the project must be less than the specified emissions limit.

SJVAPCD Rule 8011, General Requirements–Fugitive Dust Emission Sources

Fugitive dust regulations are applicable to outdoor fugitive dust sources. Operations, including construction operations, must control fugitive dust emissions in accordance with SJVAPCD Regulation VIII. According to Rule 8011, the SJVAPCD requires the implementation of control measures for fugitive dust emission sources. The project would also implement the mandatory control measures listed in Table 6-2 in the *Guide for Assessing and Mitigating Air Quality Impacts* (GAMAQI) (SJVAPCD 2002) to reduce fugitive dust emissions. These measures are not considered mitigation measures because they are required by law.

The SJVAPCD Rule 8011 requirements (some of which are not applicable to the project) are listed below:

- All disturbed areas, including storage piles, which are not being actively used for construction purposes, will be effectively stabilized for dust emissions using water or a chemical stabilizer/suppressant, or covered with a tarp or other suitable cover or vegetative ground cover.
- All on-site unpaved roads and offsite unpaved access roads will be effectively stabilized for dust emissions using water or a chemical stabilizer/suppressant.
- All land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities will be effectively controlled of fugitive dust emissions by utilizing an application of water or by presoaking.
- With the demolition of buildings up to six stories in height, all exterior surfaces of the building will be wetted during demolition.
- All materials transported off site will be covered or effectively wetted to limit visible dust emissions, and at least 6 inches of freeboard space from the top of the container will be maintained.
- All operations will limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at the end of each workday. The use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit the visible dust emissions. Use of blower devices is expressly forbidden.
- Following the addition of materials to, or the removal of materials from, the surface of outdoor storage piles, piles will be effectively stabilized to prevent fugitive dust emissions utilizing sufficient water or a chemical stabilizer/suppressant.
- Within urban areas, trackout will be immediately removed when it extends 50 or more feet from the site and at the end of each workday.
- Any site with 150 or more vehicle trips per day will prevent carryout and trackout.

SJVAPCD CEQA Guidelines

The SJVAPCD prepared the GAMAQI to assist lead agencies and project applicants in evaluating the potential air quality impacts of projects in the SJVAB (SJVAPCD 2002). The GAMAQI provides SJVAPCD-recommended procedures for evaluating potential air quality impacts during the California Environmental Quality Act (CEQA) environmental review process. The GAMAQI provides guidance on evaluating short-term (construction) and long-term (operational) air emissions. The GAMAQI is currently

being updated, but the most recent version (2002) was used in this evaluation and contains guidance on the following:

- Criteria and thresholds for determining whether a project may have a significant adverse air quality impact.
- Specific procedures and modeling protocols for quantifying and analyzing air quality impacts.
- Methods to mitigate air quality impacts.
- Information for use in air quality assessments and environmental documents that will be updated more frequently, such as air quality data, regulatory setting, climate, and topography.

SJVAPCD Plans

Planning documents for pollutants for which the study area is classified as a federal nonattainment or maintenance area are developed by SJVAPCD and CARB and approved by EPA. The SJVAB is presently guided by the California SIP (CARB 2011b) and other planning documents. The following lists the relevant SIP documents for the SJVAB:

- 2007 Ozone Plan (SJVAPCD 2010a).
- 2004 Extreme Ozone Attainment Demonstration Plan (SJVAPCD 2010b).
- 2012 $PM_{2.5}$ Plan (SJVAPCD 2012a)
- 2004 Revision to the California State Implementation Plan for Carbon Monoxide (CARB 2004).
- 2007 PM_{10} Maintenance Plan and Request for Redesignation (SJVAPCD 2009c).

2007 Ozone Attainment Plan

The 2007 8-hour Ozone Air Quality Plan contained a comprehensive list of regulatory and incentive-based measures to reduce emissions of O_3 and PM precursors throughout the San Joaquin Valley. On December 18, 2007, the SJVAPCD Governing Board adopted the plan with an amendment to extend the rule adoption schedule for organic waste operations. On January 8, 2009, EPA found that the motor vehicle budgets for 2008, 2020, and 2030 from the 2007 8-hour Ozone Plan were not adequate for transportation conformity purposes (SJVAPCD 2010a).

On May 5, 2010, EPA reclassified the 8-hour O_3 nonattainment of the San Joaquin Valley from "serious" to "extreme." The reclassification requires the State of California to incorporate more stringent requirements, such as lower permitting thresholds and implementing reasonably available control technologies at more sources (EPA 2010).

2004 Extreme Ozone Attainment Demonstration Plan

The SJVAPCD is required to submit a plan for the 1-hour O_3 standard for the San Joaquin Valley (EPA 2008). On March 8, 2010, EPA approved San Joaquin Valley's 2004 Extreme Ozone Attainment Demonstration Plan for 1-hour O_3. Effective June 15, 2005, EPA revoked the federal 1-hour O_3 standard for certain areas, including the SJVAB (SJVAPCD 2010b); however, SJVAPCD is still required to submit a plan. Due to subsequent litigation EPA withdrew its plan approval in November 2012 and the SJVAPCD and CARB withdrew this plan from consideration. SJVAPCD is revising the plan currently and plans to seek District Board approval in 2014.

2012 $PM_{2.5}$ Plan

EPA designated the SJVAB as nonattainment under the 2006 $PM_{2.5}$ national standard on October 8, 2009. The SJVAPCD Governing Board adopted the 2012 $PM_{2.5}$ Plan following a public hearing in December 2012. On January 24, 2013, CARB adopted the plan and subsequently submitted the plan to EPA as a revision to California's SIP (CARB 2013b). This far-reaching plan provides measures designed to reduce emissions such that the valley will attain the 2006 $PM_{2.5}$ federal standards and the state standard as soon

as possible. This plan satisfies the SIP requirements for compliance with the 2006 $PM_{2.5}$ standard. The NAAQS for annual $PM_{2.5}$ has recently been revised by EPA, but designations are not anticipated until 2014.

2004 Revision to California State Implementation Plan for Carbon Monoxide

On July 22, 2004, CARB approved an update to the SIP that shows how 10 areas, including the SJVAB, will maintain the CO standard through 2018; revises emission estimates; and establishes new on-road motor vehicle emission budgets for transportation conformity purposes (CARB 2004). On November 30, 2005, EPA approved and promulgated the Implementation Plans and Designation of Areas for Air Quality Purposes (EPA 2005). This revision provided a 10-year update to the CO maintenance plan and established new CO motor-vehicle emissions budgets for the purposes of determining transportation conformity.

2007 PM_{10} Maintenance Plan and Request for Redesignation

CARB approved SJVAPCD's 2007 PM_{10} Maintenance Plan and Request for Redesignation with modifications to the transportation conformity budgets. On September 25, 2008, EPA redesignated the San Joaquin Valley as attainment for the PM_{10} NAAQS and approved the PM_{10} Maintenance Plan (SJVAPCD 2009).

Local Regulations and Policies

The General Plans for the Cities of Modesto and Turlock and Stanislaus County have applicable air quality policies. Policies for Merced and San Joaquin Counties are not discussed because air quality related activities and emissions would not occur in these counties.

City of Modesto

The City of Modesto General Plan has the following applicable air quality policies:

> *Air Quality Policies (f):* The City of Modesto shall work with neighboring jurisdictions and affected agencies to address cross-jurisdictional and regional transportation and air quality issues.
>
> *Air Quality Policies (g):* The City of Modesto shall coordinate with other jurisdictions and other regional agencies in the San Joaquin valley to establish parallel air quality programs and implementation measures (trip reduction ordinances, indirect source programs, etc.).
>
> *Air Quality Policies (h):* The City of Modesto shall implement measures to reduce emissions associated with future development through the CEQA review process.
>
> *Air Quality Policies (i):* To be consistent with the SJVAPCD's Air Quality Guidelines for General Plans, the City of Modesto should consult with the SJVAPCD during CEQA review for discretionary projects with the potential for causing adverse air quality impacts.
>
> *Air Quality Policies (l):* The City of Modesto should encourage new air pollution sources such as, but not limited to, industrial, manufacturing, and processing facilities to be located an adequate distance (based on pollutant dispersion characteristics, site orientation, prevailing winds, etc.) from residential areas and other sensitive receptors.
>
> *Air Quality Policies (m):* The City of Modesto should implement measures to reduce the temporary, yet potentially significant, local air quality impacts from construction activities.
>
> *Air Quality Policies (n):* The City of Modesto shall require residential development projects and projects categorized as sensitive receptors (hospitals, schools, convalescent homes, etc.) to be located an adequate distance from existing and potential sources of toxic and/or odorous emissions such as freeways, major arterials, industrial sites, refuse transfer or disposal sites, and hazardous material locations.

Air Quality Policies (hh): The City of Modesto should work with the SJVAPCD to reduce particulate emissions from construction, grading, excavation, and demolition to the maximum extent feasible in accordance with the requirements of SJVAPCD Regulation VIII. Regulation VIII was adopted to reduce the amount of particulate matter suspended in the atmosphere as a result of emissions generated from anthropogenic (man-made) fugitive dust sources.

Air Quality Policies (ii): The City of Modesto shall require all access roads, driveways, and parking areas serving new commercial and industrial development to be constructed with materials that minimize particulate emissions in accordance with the requirements of SJVAPCD Regulation VIII and are appropriate to the scale and intensity of use.

Air Quality Policies (jj): The City of Modesto should reduce PM_{10} emissions from City of Modesto–maintained roads to the maximum extent feasible.

The following controls are required to be implemented at all construction sites:

Air Quality Policies (kk): All disturbed areas, including storage piles, which are not being actively utilized for construction purposes, shall be effectively stabilized of dust emissions using water, chemical stabilizer/suppressant, covered with a tarp or other suitable cover or vegetative ground cover.

Air Quality Policies (ll): All on-site unpaved roads and off-site unpaved access roads shall be effectively stabilized of dust emissions using water or chemical stabilizer/suppressant.

Air Quality Policies (mm): All land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities shall be effectively controlled of fugitive dust emissions utilizing application of water or by presoaking.

Air Quality Policies (nn): With the demolition of buildings up to six stories in height, all exterior surfaces of the building shall be wetted during demolition.

Air Quality Policies (oo): When materials are transported off site, all material shall be covered, or effectively wetted to limit visible dust emissions, and at least six inches of freeboard space from the top of the container shall be maintained.

Air Quality Policies (pp): All operations shall limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at the end of each workday (the use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit the visible dust emissions.) (Use of blower devices is expressly forbidden.)

Air Quality Policies (qq): Following the addition of materials to, or the removal of materials from, the surface of outdoor storage piles, said piles shall be effectively stabilized of fugitive dust emissions utilizing sufficient water or chemical stabilizer/suppressant.

Air Quality Policies (rr): Within urban areas, trackout shall be immediately removed when it extends 50 or more feet from the site and at the end of each workday.

Air Quality Policies (ss): Any site with 150 or more vehicle trips per day shall prevent carryout and trackout.

The following measures should be implemented at construction sites when required to mitigate significant PM_{10} impacts (note, these measures are to be implemented in addition to Regulation VIII requirements):

Air Quality Policies (tt): Limit traffic speeds on unpaved roads to 15 mph; and

Air Quality Policies (uu): Install sandbags or other erosion control measures to prevent silt runoff to public roadways from sites with a slope greater than one percent (1%).

The following measures are strongly encouraged at construction sites that are large in area, located near sensitive receptors, or which for any other reason warrant additional emissions reductions:

Air Quality Policies (vv): Install wheel washers for all exiting trucks, or wash off all trucks and equipment leaving the site;

Air Quality Policies (ww): Install wind breaks at windward side(s) of construction areas;

Air Quality Policies (xx): Suspend excavation and grading activity when winds exceed 20 mph (regardless of windspeed, an owner/operator must comply with Regulation VIII's 20 percent (20%) opacity limitation); and

Air Quality Policies (yy): Limit the area subject to excavation, grading, and other construction activity at any one time.

City of Turlock

The City of Turlock General Plan has the following applicable air quality policies:

8.1-a Prioritize Air Quality in Local Planning. Continue efforts to improve air quality in Turlock by integrating air quality analysis and mitigation in land use and transportation planning, environmental review, public facilities and operations, and special programs.

8.1-b Participate in Regional Efforts. Cooperate with the SJVAPCD and Stanislaus Council of Governments in developing and implementing air quality regulations and incentives.

8.1-c Coordination with Other Agencies. Work with neighboring jurisdictions and affected agencies to address cross-jurisdictional and regional transportation and air quality issues.

8.1-g Reduce Roadway Dust. Improve City roads to reduce dust to the greatest extent feasible by planting shoulders and medians. Dust from roadways contributes to PM_{10} pollution.

8.1-i Protect Residential Uses from Noxious Odors. Continue the present policy of not permitting any residential uses within a one-half mile radius of the Turlock Regional Water Quality Control Facility. Require that any new potential odor source locating within project screening trigger levels of sensitive receptors, as established by the SJVAPCD, undertake a detailed odor analysis.

8.1-l Use Air District Guidance in Environmental Review. Continue to use the SJVAPCD's Guide for Assessing and Mitigating Air Quality Impacts for determining and mitigating project air quality impacts and related thresholds of significance for use in environmental documents. Coordinate with the Air District, project applicants, and other interested parties, during pre-development consultation and negotiation over CEQA preparation.

8.1-m Minimize Roadway Dust. Require all access roads, driveways, and parking areas serving new development to be constructed with materials that minimize particulate emissions and are appropriate to the scale and intensity of use. To balance the goals of dust reduction and water infiltration, encourage the use of permeable paving or well-maintained gravel for parking spaces.

8.1-n Construction-Related Air Emissions Impacts. Continue to require mitigation measures as a condition of obtaining permits to minimize dust and air emissions impacts from construction. Require contractors to implement dust suppression measures during excavation, grading, and site preparation activities. Techniques may include, but are not limited to:

- Site watering or application of dust suppressants;
- Phasing or extension of grading operations;
- Covering of stockpiles;
- Suspension of grading activities during high wind periods (typically winds greater than 25 miles per hour); and
- Revegetation of graded areas.

County of Stanislaus

The County of Stanislaus General Plan has the following applicable air quality policies:

Policy Eighteen: The County will promote effective communication, cooperation and coordination among agencies involved in developing and operating local and regional air quality programs.

Implementation Measure 1: Refer discretionary projects under CEQA review to the SJVAPCD, neighboring jurisdictions and other affected agencies for review and comment.

Implementation Measure 2. Work with other agencies in the San Joaquin Valley to establish coordinated air quality programs and implementation measures.

Policy Nineteen: The County will strive to accurately determine and fairly mitigate the local and regional air quality impacts of proposed projects.

Implementation Measure 1. Require all development proposals, where appropriate, to include reasonable air quality mitigation measures.

Implementation Measure 2. Minimize case-by-case analysis of air quality impacts through the use of standard criteria for determining significant environmental effects, a uniform method of calculating project emissions.

3.3.3 Impact Analysis/Environmental Consequences

Methodology for Analysis

This section evaluates whether construction and operation of the proposed project and its actions would result in significant impacts related to air quality and odors.

As required by SJVAPCD, the California Emission Estimator Model (CalEEMod) version 2013.2.2 was used to quantify criteria pollutant emissions from the proposed project construction and operation activities. CalEEMod incorporates numerous default assumptions and CARB emission factors for on-road and off-road vehicles (EMFAC 2013 and In-Use Off-Road Equipment Inventory Model 2011). Below is a brief summary of the CalEEMod site-specific inputs used to estimate emissions from the proposed project. Further CalEEMod inputs and outputs are available in **Appendix B**.

The proposed project is assumed to take approximately 1.5 years to construct from summer of 2016 through spring of 2018. The anticipated construction schedules for the combined alignment and single alignment alternatives were provided (see **Appendix C**) and are summarized in **Table 3.3-5**. In general, it was assumed that five construction crews were working simultaneously.

The equipment anticipated to be used during each construction phase is shown in **Table 3.3-6 and 3.3-7**. The equipment was mapped to an appropriate CalEEMod equipment type and default horsepower and load factors were utilized unless it was mapped to a general equipment category which used a typical equipment size that may be used for the proposed project construction activities.

The number of worker and material hauling trips is shown in **Table 3.3-8**. Worker trips were assumed to be 20 miles one-way and material hauling trips were assumed to be 30 miles one way.

Once the baseline construction emissions associated with the alternatives were estimated, mitigation options were evaluated to see if on-site mitigation would be possible to reduce emissions below the significance thresholds. First, the impact of requiring phased trips for all trucks hauling trench spoil and backfill, such that all trucks importing backfill material to the site would leave with excavated material that needs to be exported, was investigated. This significantly reduces the number of trench material hauling trips. Second, the impact of using newer engines was investigated. It was assumed that all off-road vehicle engines above 50 horsepower would meet EPA Tier 3 engine standards. The use of newer Tier 3 engines compared to the average fleet mix results in lower emissions for several criteria pollutants, in particular NO_x.

Table 3.3-5: Construction Schedule

Phase Name	Phase Type	Phase Start Date	Phase End Date	Days per Week	Number of Days
Combined Alignment Alternative					
Construction Weir	Site Preparation	6/20/2016	07/15/2016	5	20
Construction Weir	Grading	07/18/2016	09/09/2016	5	40
Construction Weir	Building Construction	09/12/2016	11/18/2016	5	50
Construction Weir	Paving	11/21/2016	12/02/2016	5	10
Construction Pipe	Site Preparation	6/20/2016	07/14/2016	5	19
Construction Pipe	Trenching	07/15/2016	10/25/2016	5	73
Construction Pipe	Building Construction	10/26/2016	12/30/2016	5	48
Construction Pipe	Paving	01/02/2017	02/08/2017	5	28
Pump Station	Construction	06/20/2016	09/09/2016	5	60
Pump Station	Equipment Installation	09/12/2016	12/02/2016	5	60
River Crossing	Site Preparation	06/20/2016	06/02/2017	5	240
Water Truck	Grading	06/20/2016	03/31/2018	5	450
Separate Alignment Alternative					
Construction Weir Modesto	Site Preparation	06/20/2016	07/15/2016	5	20
Construction Weir Modesto	Grading	07/18/2016	09/09/2016	5	40
Construction Weir Modesto	Building Construction	09/12/2016	11/18/2016	5	50
Construction Weir Modesto	Paving	11/21/2016	12/02/2016	5	10
Construction Weir Turlock	Site Preparation	12/05/2016	12/23/2016	5	20
Construction Weir Turlock	Grading	12/26/2016	02/17/2017	5	40
Construction Weir Turlock	Building Construction	02/20/2017	04/28/2017	5	50
Construction Weir Turlock	Paving	05/01/2017	05/12/2017	5	10
Construction Pipe	Site Preparation	06/20/2016	07/14/2016	5	19
Construction Pipe	Trenching	07/15/2016	11/11/2016	5	86
Construction Pipe	Building Construction	11/14/2016	01/31/2017	5	57
Construction Pipe	Paving	01/2/2017	02/8/2017	5	28
Pump Station Modesto	Site Preparation	06/20/2016	09/09/2016	5	60
Pump Station Modesto	Building Construction	09/12/2016	12/02/2016	5	60
Pump Station Turlock	Site Preparation	06/20/2016	10/21/2016	5	90
Pump Station Turlock	Building Construction	10/24/2016	1/13/2017	5	60
River Crossing Modesto	Trenching	06/20/2016	6/2/2017	5	240
River Crossing Turlock	Trenching	06/05/2017	05/04/2018	5	240
Water Truck	Grading	06/20/2016	03/31/2018	5	450

Source: **Appendix B, Appendix C**

Table 3.3-6: Construction Equipment Total Hours of Use Combined Alignment

Off-Road Equipment Type	Horsepower	Load Factor	Total Equipment Hours Phase Combined Alignment: Construction Weir Site Prep	Construction Weir Excavation	Construction Weir Construction	Construction Weir Paving	Construction Pipe Site Prep	Construction Pipe Trenching	Construction Pipe Pipeline	Construction Pipe Backfill and Paving	Pump Station Construction	Pump Station Equipment Install	River Crossing	Water Truck
Air Compressors	78	0.48			50									
Bore/Drill Rigs	60	0.5											360	
Bore/Drill Rigs	205	0.5		240										
Cement and Mortar Mixers	9	0.56				240								
Concrete/Industrial Saws	81	0.73		320										
Cranes	226	0.29			200						240	240	960	
Excavators	162	0.38		80				1168			480		1920	
Forklifts	89	0.2			600									
Graders	174	0.41	160					1168	768					
Off-Highway Trucks	400	0.38								896			720	1800
Other Construction Equipment	104	0.42									480		480	
Other Construction Equipment	215	0.42											480	
Pavers	125	0.42				70								
Pumps	84	0.74			100									
Rollers	80	0.38				70				448				
Rubber Tired Dozers	255	0.4		40			304	1168			480		480	
Rubber Tired Loaders	199	0.36									480	120	480	
Scrapers	361	0.48					304	2336	1536					
Signal Boards	6	0.82					1520	5840	3840	2240				
Tractors/Loaders/Backhoes	97	0.37	160	480	800	70		2336	1536	896				
Trenchers	80	0.5							768					

Table 3.3-7: Construction Equipment Total Hours of Use Separate Alignment

Off-Road Equipment Type	Horsepower	Load Factor	Total Equipment Hours Separate Alignment: Construction Weir Site Prep	Construction Weir Excavation	Construction Weir Construction	Construction Weir Paving	Construction Weir Site Prep Turlock	Construction Weir Excavation Turlock	Construction Weir Construction Turlock	Construction Weir Paving Turlock	Construction Pipe Site Prep	Construction Pipe Trenching	Construction Pipe Pipeline	Construction Pipe Backfill and Paving	Pump Station Construction	Pump Station Equipment Install	Pump Station Construction Turlock	Pump Station Equipment Install Turlock	River Crossing Modesto	River Crossing Turlock	Water Truck Modesto	Water Truck Turlock
Air Compressors	78	0.48			50				50													
Bore/Drill Rigs	60	0.5																	360	360		
Bore/Drill Rigs	205	0.5		240				240														
Cement and Mortar Mixers	9	0.56				240				240												
Concrete/ Industrial Saws	81	0.73		320				320														
Cranes	226	0.29			200				200						240	240	360	240	960	960		
Excavators	162	0.38		80				80				1376			480		1440		1920	1920		
Forklifts	89	0.2			600				600													
Graders	174	0.41	160				160					1376	912									
Off-Highway Trucks	400	0.38												896			972		720	720	1800	1800
Other Construction Equipment	104	0.42													480		720		480	480		
Other Construction Equipment	215	0.42																	480	480		
Pavers	125	0.42				70				70												
Pumps	84	0.74			100				100													
Rollers	80	0.38				70				70				448								

Off-Road Equipment Type	Horsepower	Load Factor	Total Equipment Hours Separate Alignment																			
			Construction Weir Site Prep	Construction Weir Excavation	Construction Weir Construction	Construction Weir Paving	Construction Weir Site Prep Turlock	Construction Weir Excavation Turlock	Construction Weir Construction Turlock	Construction Weir Paving Turlock	Construction Pipe Site Prep	Construction Pipe Trenching	Construction Pipe Pipeline	Construction Pipe Backfill and Paving	Pump Station Construction	Pump Station Equipment Install	Pump Station Construction Turlock	Pump Station Equipment Install Turlock	River Crossing Modesto	River Crossing Turlock	Water Truck Modesto	Water Truck Turlock
Rubber Tired Dozers	255	0.4		40				40			304	1376			480		243		480	480		
Rubber Tired Loaders	199	0.36													480	120	720	120	480	480		
Scrapers	361	0.48									304	2752	1824									
Signal Boards	6	0.82									1520	6880	4560	2240								
Tractors/ Loaders/ Backhoes	97	0.37	160	480	800	70	160	480	800	70		2752	1824	896								
Trenchers	80	0.5											912									

Table 3.3-8: Worker and Material Hauling Trips

Phase Name	Worker Trips Per Day	Total Material Hauling Trips
Combined Alignment		
Construction Weir	14	128 unphased 64 phased
Construction Pipe	32	15,118 unphased 8,400 phased
Pump Station Construction	18	60 unphased 42 phased
River Crossing	24	(accounted for in construction pipe)
Water Truck	24	0
Separate Alignment		
Construction Weir	14	128 unphased 64 phased
Construction Weir Turlock	14	128 unphased 64 phased
Construction Pipe	32	22,996 unphased 12,778 phased
Pump Station Modesto	18	60 unphased 42phased
Pump Station Turlock	18	86 unphased 50 phased
River Crossing Modesto	24	(accounted for in construction pipe)
River Crossing Turlock	24	(accounted for in construction pipe)
Water Truck Modesto	2	0
Water Truck Turlock	2	0

Source: **Appendix B**, **Appendix C**

Regarding operational emissions, only sporadic vehicle trips would be needed for maintenance and inspection. Since the amount of trips is not known, but likely substantially less than the small project threshold established by SJVAPCD, no operational emissions from vehicles were estimated. The pumps would be electricity-driven, and electricity was conservatively assumed to be supplied by Modesto Irrigation District. While the NVRRWP facilities may use electricity from the Turlock Irrigation District, using the Modesto Irrigation District is conservative since it has slightly higher GHG emissions per unit of electricity, and final determination of the source of electricity has not been made. No criteria pollutants are associated with electricity use, but indirect GHG emissions were estimated using CalEEMod. The single alignment alternative may also require an emergency generator at the Turlock Harding Drain Bypass Pipeline. This was not evaluated in CalEEMod since this a permitted stationary source and would undergo permitting procedures that are assumed to result in emissions below the significance thresholds.

Regarding other operational impacts associated with the proposed project and occurring in the project area, impact significance was determined qualitatively by considering the project emission sources and duration, and/or by applying the SJVAPCD's Small Project Analysis Level (SJVAPCD 2012b) trip generation rates. The SJVAPCD has established thresholds of significance for criteria pollutant

emissions, which are based on SJVAPCD New Source Review offset requirements for stationary sources. Using project type and size, the SJVAPCD has estimated emissions and determined a size below which it is reasonable to conclude that a project would not exceed applicable thresholds of significance for criteria pollutants.

Thresholds of Significance

Consistent with Appendix G of the *CEQA Guidelines* an air quality impact would be considered significant if the project would:

- Conflict with or obstruct implementation of the applicable air quality plan.
- Violate any air quality standard established by EPA or CARB, or contribute substantially to an existing or projected air quality violation, in comparison to the SJVAPCD thresholds below.
- Expose sensitive receptors to substantial air pollutant concentrations.
- Create objectionable odors affecting a substantial number of people.

GAMAQI Thresholds

The SJVAPCD has developed quantifiable significance thresholds to address the potential impacts identified in the CEQA Guidelines. The 2002 SJVAPCD GAMAQI listed quantifiable thresholds for operational VOC and NO_x only, but it makes reference to SJVAPCD stationary source offset requirements. The Draft 2012 GAMAQI reiterates the use of stationary source requirements as a threshold and specifically lists the values. SJVAPCD states that a significant impact would occur if implementation of the proposed project would result in emissions that exceed the following SJVAPCD thresholds shown in **Table 3.3-9**.

Table 3.3-9: SJVAPCD CEQA Significance Thresholds

Pollutant	Construction Emissions	Operational Emissions	
		Permitted Equipment and Activities	Non-Permitted Equipment and Activities
Emissions (tons per year)			
CO	100	100	100
NO_x	10	10	10
VOC	10	10	10
SO_x	27	27	27
PM_{10}	15	15	15
$PM_{2.5}$	15	15	15

Source: SJVAPCD 2014b.

These thresholds are applied separately to construction and operations emissions, even if there is overlap in the emissions. Therefore, for this analysis a comparison of project emissions to the thresholds shown in **Table 3.3-9** is used to determine whether the proposed project would violate ambient air quality standards.

According to SJVAPCD's guidance, operation and construction emissions are considered to be a less-than-significant impact if fugitive dust (PM_{10} and $PM_{2.5}$) emissions are below the significance level listed above. In addition, SJVAPCD Regulation VIII requires all projects that involve earthmoving or travel on unpaved roads to implement fugitive dust control measures; implementation of the control measures

would constitute sufficient measures to reduce PM_{10} and $PM_{2.5}$ impacts to a level considered less than significant.

Quantitative TAC thresholds of significance identified in the GAMAQI include:

- Probability of contracting cancer for the Maximally Exposed Individual (MEI) exceeds 10 in a million.
- Ground-level concentrations of non-carcinogenic TACs would result in a Hazard Index greater than 1 for the MEI.

However, since locations of the specific emissions are not known and would be continually moving in time during the pipeline construction, a qualitative analysis was performed to determine the impact significance of potential TAC emissions. For the proposed project construction and operation, health risks from TACs were evaluated by identifying the project's potential to generate TAC emissions and by determining whether sensitive receptors could be affected by those emissions.

To determine whether the project is consistent with existing air quality plans, the analysis examines whether the project is consistent with relevant general or specific plans upon which the air plans are based.

Small Project Analysis Level

SJVAPCD has established screening levels based on project types (land use) and sizes (e.g., square footage, housing units). Projects below these sizes are considered to have emissions below the numeric thresholds of significance for criteria pollutants. The proposed project is categorized as General Light Industrial Land Use. Projects that are at or below these criteria would result in less-than-significant impacts:

- Industrial land uses: result in vehicle trips of 1,506 trips/day;
- General light industrial land uses: construct 510,000 square feet.

Impacts and Mitigation Measures

Impact AIR-1 Construction emissions of criteria pollutants and precursors

Estimates of construction emissions associated with both alternatives were estimated using CalEEMod with assumptions specified above and in **Appendix B**. These emissions are compared to the CEQA significance thresholds shown in **Table 3.3-9**. The project has already made the environmental commitment to implement all dust control measures needed to meet SJVAPCD requirements, so fugitive dust emissions of PM_{10} and $PM_{2.5}$ are considered less than significant. This analysis therefore focuses on other criteria pollutants.

Combined Alignment Alternative

Under standard equipment assumptions including unphased material hauling trips, the anticipated construction emissions associated with this alternative are shown in **Table 3.3-10**. Based on comparison to the significance thresholds, all pollutants except NO_x are below the construction emission thresholds. Thus, NO_x emissions would be considered potentially significant for the combined alignment alternative construction.

Table 3.3-10: Combined Alignment Alternative Construction Emissions

Year	Scenario[1]	VOC	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$
		tons per year					
2016	Unmitigated	1.45	16.34	11.09	0.021	1.61	1.03
	Phased Reduction		(1.32)				
	Tier 3 Reduction		(7.67)				
	Mitigated Potential		7.35				
2017	Unmitigated	0.17	1.72	1.02	.0025	0.20	0.087
	Phased Reduction		(0)				
	Tier 3 Reduction		(0.69)				
	Mitigated Potential		1.03				
2018	Unmitigated	0.013	0.14	0.072	.00023	0.098	0.015
	Phased Reduction		(0)				
	Tier 3 Reduction		(.036)				
	Mitigated Potential		0.10				
CEQA Significance Threshold		10	10	100	27	15	15

Notes:

1. The amount of reduction that occurs as a result of mitigation (material hauling phasing or Tier 3 equipment) is shown in parentheses for NO_x only. There may be reductions in other pollutants as well and a minor increase in CO but that would not increase emissions above significance thresholds. Calculations are shown in **Appendix B**.

Source: **Appendix B**

To determine if mitigation is available to reduce NO_x emissions through on-site measures to below the NO_x construction significance threshold of 10 tons per year, the emissions reduction associated with both phased material hauling trips and use of Tier 3 engines for all equipment above 50 horsepower was estimated using CalEEMod. Based on the reductions that would occur from these activities, shown in **Table 3.3-10**, emissions could be reduced with on-site measures to below the 10 tons per year NO_x significance threshold. However, because detailed design is not complete it is possible that there could be changes in the specific construction equipment required, with resulting changes in estimated emissions. Since this project would be subject to General Conformity, if emissions cannot be reduced to below 10 tons per year on-site, than emissions would need to be off-set to **zero tons per year** according to acceptable conformity requirements. Thus, **Mitigation Measure AIR-1** would be implemented which provides for the option of mitigating emissions on-site to below 10 tons per year or to offset emissions to zero tons per year by funding SJVAPCD's Emission Reduction Incentive Program (ERIP) which provides verified pound-for-pound off-sets within the SJVAB. With implementation of **Mitigation Measure AIR-1**, project impacts would be less than significant.

Separate Alignment Alternative

Under standard equipment assumptions including unphased material hauling trips, the anticipated construction emissions associated with this alternative are shown in **Table 3.3-11**. Based on comparison to significance thresholds, all pollutants except NO_x would be below the construction emission thresholds. Thus, NO_x emissions would be considered potentially significant for the combined alignment alternative construction.

Table 3.3-11: Separate Alignment Alternative Construction Emissions

Year	Scenario[1]	VOC	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$
		tons per year					
2016	Unmitigated	1.82	20.74	13.95	0.029	1.90	1.23
	Phased Reduction		(2.02)				
	Tier 3 Reduction		(9.14)				
	Mitigated Potential		9.58				
2017	Unmitigated	0.59	6.25	3.98	.0078	0.57	0.40
	Phased Reduction		(0)				
	Tier 3 Reduction		(2.88)				
	Mitigated Potential		3.37				
2018	Unmitigated	0.042	0.43	0.27	.00078	0.034	0.020
	Phased Reduction		(0)				
	Tier 3 Reduction		(0.16)				
	Mitigated Potential		0.27				
CEQA Significance Threshold		10	10	100	27	15	15

Notes:

1. The amount of reduction that occurs as a result of mitigation (material hauling phasing or Tier 3 equipment) is shown in parentheses for NO_x only. There may be reductions in other pollutants as well and a minor increase in CO but that would not increase emissions above significance thresholds. Calculations are shown in **Appendix B**.

Source: **Appendix B**

To determine if there is mitigation available to reduce NO_x emissions through on-site measures to below the NO_x construction significance threshold of 10 tons per year, the emissions reduction associated with both phased material hauling trips and use of Tier 3 engines for all equipment above 50 horsepower was estimated using CalEEMod. Based on the reductions that would occur from these activities shown in **Table 3.3-11**, emissions could be reduced with on-site measures to below the 10 tons per year NO_x significance thresholds. However, because detailed design is not complete it is possible that there could be changes in the specific construction equipment required, with resulting changes in estimated emissions. Since this project would be subject to General Conformity, if emissions cannot be reduced to

below 10 tons per year on-site, than emissions would need to be off-set to **zero tons per year** according to acceptable conformity requirements. Thus, **Mitigation Measure AIR-1** would be implemented which provides for the option of mitigating emissions on-site to below 10 tons per year or to offset emissions to zero tons per year by funding SJVAPCD's ERIP which provides verified pound-for-pound off-sets within the SJVAB. With implementation of **Mitigation Measure AIR-1**, the project impacts would be less than significant.

PID Conveyance Alternative

The potential for emissions from this alternative are described in comparison to the estimated emissions that would result from the Combined Alignment Alternative. The PID Conveyance Alternative would require construction of 30,100 feet of pipeline, which is less than half the length of the pipeline required for the Combined Alignment Alternative. The PID Conveyance Alternative would not require construction of a river crossing, but would require construction of an expanded intake facility and new pumps at the existing PID intake. Emissions during construction are thus conservatively estimated to be about half of the emissions associated with construction of the Combined Alignment Alternative. Because details of construction schedule and equipment have not been developed, although emissions are likely to be less than the Combined Alignment Alternative, it is assumed that mitigation may still be required to ensure that emissions are not significant.

No Action Alternative

Under the no action alternative there would be no construction required. There would be no construction emissions and therefore no impact on air quality.

Significance Determination before Mitigation

Potentially significant (Alternatives 1, 2 and 3); no impact (No Action Alternative).

Mitigation Measures

Mitigation Measure AIR-1: Reduce NOx Emissions (Alternatives 1, 2 and 3)

NOx emissions associated with construction activities shall be reduced to 10 tons per year through on-site equipment and hauling vehicle mitigation measures to the extent feasible. All vehicles and equipment used during construction shall be maintained and properly tuned in accordance with the manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation. Emissions reduction methods may be chosen from any combination of the following measures:

- Use of alternative fueled vehicles
- Use of newer tier engines
- Use of phased material hauling trips
- Use of after-market pollution control devices to reduce emissions
- Lengthening the construction schedule to reduce the annual intensity of construction activities

If all feasible on-site measures have been implemented and annual emissions are anticipated to still be above 10 tons per year for NOx, then the project proponent shall enter into a Voluntary Emissions Reduction Agreement (VERA) with SJVAPCD. The VERA would provide pound-for-pound mitigation of air emissions increases down to a net zero emissions per year as required under general conformity through a process that develops, funds, and implements emission reduction projects. SJVAPCD would serve as administrator of the emissions reduction projects and verifier of the successful mitigation effort.

Under the VERA, the project proponent shall agree to mitigate project-specific emissions by providing funds for the SJVAPCD's ERIP. The funds would be disbursed by ERIP in the form of grants for projects that achieve emission reductions. Types of emission reduction projects that have been funded in the past include electrification of stationary internal combustion engines (such as agricultural irrigation pumps), replacing old heavy-duty trucks with new, cleaner, more efficient heavy-duty trucks, and replacement of old farm tractors. The initial agreement would generally be based on the projected maximum emissions increases as calculated by a SJVAPCD-approved air quality impact assessment, and contain the corresponding maximum fiscal obligation. However, because the goal is to mitigate actual emissions, the SJVAPCD has designed flexibility into the VERA such that the final mitigation would be based on actual emissions related to the project as determined by actual equipment used, hours of operation, and duration of work. After the project is mitigated, the SJVAPCD would certify to the lead agency that the mitigation is completed, providing the lead agency with an enforceable mitigation measure demonstrating that project-specific emissions have been mitigated to less than significant.

Significance after Mitigation

Less than significant.

Impact AIR-2 Local community risks and hazards during construction

Combined Alignment Alternative

The closest sensitive receptors to construction under this alternative consist of several residences located adjacent to the roadways along the pipeline alignments. No sensitive receptors are located near the pump station location. The pollutants of concern that would affect sensitive receptors would be particulates, specifically PM_{10} and $PM_{2.5}$ contained in fugitive dust, and DPM from construction equipment. The control of particulates and fugitive dust is discussed above in Impact AIR-1 and SJVAPCD Regulation VIII, which would be implemented during construction activities to minimize exposure to fugitive dust. The construction period for the proposed project, which is approximately 1.5 years and would be continually moving in location along the pipeline alignment, would not involve the use of substantial quantities of construction equipment and thus would not emit any substantial quantities of DPM. DPM exposure of 1.5 years from construction equipment is generally not quantified, as cancer potency factors are based on life-time exposure and there is considerable uncertainty in trying to evaluate the cancer risk from projects that would only last a small fraction of a lifetime (OEHHA 2012). Thus, the proposed project would not pose long-term or significant health risks to nearby residents and workers in the vicinity of the proposed project site. The impact on sensitive receptors from fugitive dust and other pollutants would be less than significant.

Separate Alignment Alternative

Emissions would be as described for the Combined Alignment Alternative, though the specific receptors would be somewhat different. Residences along the northern alignment would be the same, but there would be additional residents along the southern alignment segment that would be affected by this alternative. The proposed project would not pose long-term or significant health risks to nearby residents and workers in the vicinity of the proposed project site. The impact on sensitive receptors from fugitive dust and other pollutants would be less than significant.

PID Conveyance Alternative

Impacts would be similar to those described for the Combined Alignment Alternative. Thus, the proposed project would not pose long-term or significant health risks to nearby residents and workers in the vicinity of the proposed project site. The impact on sensitive receptors from fugitive dust and other pollutants would be less than significant.

No Action Alternative

Under the no action alternative, there would be no construction and no construction emissions. There would be no impact on air quality.

Significance Determination before Mitigation

Less than significant for all action alternatives.

Mitigation Measures

No mitigation required.

Impact AIR-3 Odors generated during project construction

Construction activities under the proposed project would not result in the generation of permanent or long-term objectionable odors. Odors associated with the intermittent operation of diesel-powered equipment might be detected by nearby sensitive receptors, but these odors would be of short duration and would not affect a substantial number of people. Soil excavated or brought up from trenchless construction may contain organic material that is decaying that may create an objectionable odor. The intensity of the odor perceived by a receptor depends on the distance of the receptor from the construction activity and the amount and quality of the exposed soil material. The location of the construction activities would be limited and in a rural area not located near a large number of receptors. Exposed soil would be either quickly reused on-site or hauled and disposed of properly off-site. Therefore any odor that could be produced would be short-term and temporary.

Combined Alignment Alternative

This impact would be less than significant.

Separate Alignment Alternative

This impact would be less than significant.

PID Conveyance Alternative

This impact would be less than significant.

No Action Alternative

Under the no action alternative, there would not be any construction and therefore no additional odors could occur.

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

No mitigation required.

Impact AIR-4 Direct emissions of criteria pollutants during project operation

Combined Alignment Alternative

Under the combined alignment alternative, there would only be occasional trips associated with pipeline maintenance and inspection. The SJVAPCD's small project analysis level guidance states that general industrial activities generating less than 1,506 trips per day are assumed to have a less-than-significant impact on air quality, and criteria pollutant emissions associated with these activities would not need to be quantified. The proposed project's activities would result in a fraction of this truck trip significance threshold and these limited maintenance trips would not be expected to conflict with or obstruct implementation of the local air districts' air quality plans or increase criteria pollutant emissions above the significant thresholds. The impact would be less-than-significant.

Separate Alignment Alternative

Under the separate alignment alternative, there would be occasional trips associated with pipeline maintenance and inspection. The SJVAPCD's small project analysis level guidance states that general industrial activities generating less than 1,506 trips per day are assumed to have a less-than-significant impact on air quality, and criteria pollutant emissions associated with these activities would not need to be quantified. The pump station at the Harding Drain Bypass Pipeline would require an emergency generator that would be permitted under SJVAPCD stationary source permits, which require sources to achieve BACT and offset any emissions above the significance thresholds. The only operational emissions that would routinely occur would be for periodic testing. Given the small number of maintenance trips and the limited use of the emergency generator for testing along with permit requirements, the proposed project would not be expected to increase criteria pollutant emissions above the significant thresholds. The impact would be less-than-significant.

PID Conveyance Alternative

Under the PID Conveyance Alternative, there would be occasional trips associated with pipeline maintenance and inspection. The SJVAPCD's small project analysis level guidance states that general industrial activities generating less than 1,506 trips per day are assumed to have a less-than-significant impact on air quality, and criteria pollutant emissions associated with these activities would not need to be quantified. The pump at the PID Intake may require an emergency generator that would be permitted under SJVAPCD stationary source permits, which require sources to achieve BACT and offset any emissions above the significance thresholds. The only operational emissions that would routinely occur would be for periodic testing. Given the small number of maintenance trips and the limited use of the emergency generator for testing along with permit requirements, the proposed project would not be expected to increase criteria pollutant emissions above the significant thresholds. The impact would be less-than-significant.

No Action Alternative

Under the no action alternative, treated waste water would continue to be discharged to the San Joaquin River or disposed of on land. There would be no change in operational emissions from current practices and thus no impact on air quality.

Significance Determination before Mitigation

Less than significant for all action alternatives.

Mitigation Measures

No mitigation required.

Impact AIR-5 Local community risks and hazards during project operation

Combined Alignment Alternative

Diesel particulate matter from truck exhaust represents the primary health risk from operation of the pipeline. Truck exhaust would only be emitted during maintenance and pipeline inspection activities, which are anticipated to be minimal. Given the small number of trips and the fact that CARB regulations limit diesel truck idling to 5 minutes or less, the proposed project would not expose any nearby residents or other sensitive receptors to significant health risks during project operation and impacts are considered less than significant.

Separate Alignment Alternative

Diesel particulate matter from truck exhaust and an emergency generator represents the primary health risk from operation of the pipeline. Truck exhaust would only be emitted during maintenance and pipeline inspection activities, which are anticipated to be minimal. Given the small number of trips and

the fact that CARB regulations limit diesel truck idling to 5 minutes or less, the proposed project would not expose any nearby residents or other sensitive receptors to significant health risks from truck exhaust during project operation. The emergency generator would only operate under emergency situations and for periodic testing. The emergency generator would be a permitted source under SJVAPCD regulations which require BACT standards and that health risks are minimized such that sensitive receptors are not exposed to any significant health risks. Given the minimal amount of trucks and permit requirements for the emergency generator, the impacts to the health of sensitive receptors are considered less than significant.

PID Conveyance Alternative

Diesel particulate matter from truck exhaust and an emergency generator represents the primary health risk from operation of the pipeline. Truck exhaust would only be emitted during maintenance and pipeline inspection activities, which are anticipated to be minimal. Given the small number of trips and the fact that CARB regulations limit diesel truck idling to 5 minutes or less, the proposed project would not expose any nearby residents or other sensitive receptors to significant health risks from truck exhaust during project operation. The emergency generator would only operate under emergency situations and for periodic testing. The emergency generator would be a permitted source under SJVAPCD regulations, which require BACT standards and that health risks are minimized such that sensitive receptors are not exposed to any significant health risks. Given the minimal amount of trucks and permit requirements for the emergency generator, the impacts to the health of sensitive receptors are considered less than significant.

No Action Alternative

Under the no action alternative, treated waste water would continue to be discharged to the San Joaquin River or disposed of on land. There would be no change from current operations and thus no new operational emissions would be generated.

Significance Determination before Mitigation

Less than significant for all action alternatives.

Mitigation Measures

No mitigation required.

Impact AIR-6 Odor emissions during project operation

Under the proposed project, treated waste water would be discharged into the DMC instead of the San Joaquin River. Effluent proposed for discharge would undergo tertiary treatment. Water that has undergone this level of treatment generally does not have any offensive odors associated with it.

Combined Alignment Alternative

Impacts related to odor under this alternative would be considered less-than-significant.

Separate Alignment Alternative

Impacts related to odor under this alternative would be considered less-than-significant.

PID Conveyance Alternative

Under this alternative, treated wastewater would continue to be discharged into the San Joaquin River or disposed of on land. Effluent proposed for discharge would undergo tertiary treatment. Water that has undergone this level of treatment generally does not have any offensive odors associated with it. Impacts related to odor under this alternative would be considered less-than-significant.

No Action Alternative

Under the no action alternative, treated waste water would continue to be discharged to the San Joaquin River or disposed of on land. Effluent proposed for discharge would undergo tertiary treatment. Water that has undergone this level of treatment generally does not have any offensive odors associated with it, and impacts would be less than significant.

Significance Determination before Mitigation

Less than significant for all alternatives.

Mitigation Measures

No mitigation required.

Impact AIR-7 Consistency with applicable air quality plans

The proposed project is located in the SJVAB, which is currently designated as a non-attainment area for federal and state ozone and $PM_{2.5}$ standards, and state PM_{10} standards. SJVAPCD has developed Air Quality Attainment Plans (AQAPs) and prepares associated triennial updates. AQAPs present comprehensive strategies to reduce VOCs, NO_X, PM_{10}, and $PM_{2.5}$ emissions from stationary, area, mobile, and indirect sources. VOC and NO_X are the principal precursor pollutants that cause the formation of ozone, the non-attainment pollutant commonly known as smog. Strategies in the AQAPs include the adoption of rules and regulations; enhancement of CEQA participation; implementation of a new and modified indirect source review program; adoption of local air quality plans; and stationary, mobile, and indirect-source control measures. The proposed project would not modify land uses from those anticipated in the County and City General Plans and in the SJVAPCD AQAP for long-range air quality planning and would not facilitate further growth.

Combined Alignment Alternative

The combined alignment alternative would result in construction of pipelines and modification of an existing pump station. Specific air quality impacts related to criteria pollutants are discussed in impact AIR-1 and AIR-4. The project includes relevant mitigation requirements that are contained within the SJVAPCD AQAP and would comply with SJVAPCD regulations. Therefore, the combined alignment alternative would not conflict with or obstruct the SJVAPCD AQAPs and the impact would be less than significant.

Separate Alignment Alternative

The separate alignment alternative would result in construction of pipelines, modification of an existing pump station, and construction of a new pump station. Impacts would be similar to those of the combined alignment alternative. The separate alignment alternative would not conflict with or obstruct the SJVAPCD AQAPs and the impact would be less than significant.

PID Conveyance Alternative

This alternative would result in construction of pipelines and modification of an existing intake, including construction of a new pump. Impacts would be similar to those of Alternatives 1 and 2, with slightly lower emissions during construction. This alternative would not conflict with or obstruct the SJVAPCD AQAPs and the impact would be less than significant.

No Action Alternative

Under the no action alternative, treated wastewater would continue to be discharged to the San Joaquin River or disposed of on land. There would be no change in emissions from current practice and current practice is consistent with SJVAPCD AQAP.

Significance Determination before Mitigation

Less than significant for all action alternatives.

Mitigation Measures

No mitigation required.

Impact AIR-8 Cumulative Impact on Air Quality

The SJVAB is currently designated as a nonattainment area for federal and state ozone and $PM_{2.5}$ standards, and state PM_{10} standards. Past, present, and probable future projects would have a significant cumulative impact on air quality in the project area. The SJVAPCD has adopted a cumulative threshold of significance of 10 tons per year for ozone precursors (VOC and NO_x) and 15 tons per year for PM_{10} and $PM_{2.5}$.

Combined Alignment Alternative

Operation of this alternative would result in emissions of particulate matter and exhaust gases that would not exceed applicable criteria. However, it is possible that construction activities associated with this alternative would exceed the criteria for NO_x, which is considered a considerable contribution to a significant cumulative impact. Implementation of **Mitigation Measure AIR-1** would reduce construction air emissions to levels below SJVAPCD's construction significance thresholds. Therefore, with implementation of **Mitigation Measure AIR-1**, the incremental contribution of this alternative would not be cumulatively considerable.

Separate Alignment Alternative

Operation of this alternative would result in emissions of particulate matter and exhaust gases that would not exceed applicable criteria. However, it is possible that construction activities associated with this alternative would exceed the criteria for NO_x, which is considered a considerable contribution to a significant cumulative impact. Implementation of **Mitigation Measure AIR-1** would reduce construction air emissions to levels below SJVAPCD's construction significance thresholds. Therefore, with implementation of **Mitigation Measure AIR-1**, the incremental contribution of this alternative would not be cumulatively considerable.

PID Conveyance Alternative

Operation of this alternative would result in emissions of particulate matter and exhaust gases that would not exceed applicable criteria. However, it is possible that construction activities associated with this alternative would exceed the criteria for NO_x, which is considered a considerable contribution to a significant cumulative impact. Implementation of **Mitigation Measure AIR-1** would reduce construction air emissions to levels below SJVAPCD's construction significance thresholds. Therefore, with implementation of **Mitigation Measure AIR-1**, the incremental contribution of this alternative would not be cumulatively considerable.

No Action Alternative

The SJVAB is currently designated as a nonattainment area for federal and state ozone and $PM_{2.5}$ standards, and state PM_{10} standards. Past, present, and probable future projects would have a significant cumulative impact on air quality in the project area. Since there would be no new emissions associated with the no action alternative, the emissions would not be cumulatively considerable.

Significance Determination before Mitigation

Potentially significant for all action alternatives.

Mitigation Measures

Mitigation Measure AIR-1.

Significance Determination after Mitigation

Less than significant.

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3.4 Biological Resources

This chapter discusses the potential for the proposed project to affect wetland, riparian, and upland habitats, and the special-status plant, fish, and wildlife species that may utilize these habitats. Specifically, this section: (1) discusses federal, state, and local regulations relevant to vegetation and wildlife resources that may be affected by the proposed project; (2) describes the existing environmental setting in the Potentially Affected Area; (3) identifies plant, fish, and wildlife species potentially affected by the proposed project; and (4) proposes avoidance, minimization and compensation measures to reduce the potentially significant impacts to satisfy the requirements of both CEQA and NEPA (see discussion in Sections 1.4 and 3.0 for corresponding terminology).

The following appendices support this section, unless otherwise specified in the text below:

- **Appendix D**: Supporting Documentation Related to Biological Resources
- **Appendix E**: Assessment of Potential Effects of the North Valley Regional Recycled Water Program Reductions in Freshwater Discharges into the San Joaquin River on Fishery Habitat and Juvenile Salmon Survival (Hanson 2013)
- **Appendix F**: Draft Sample Frac-out Prevention Plan for Horizontal Directional Drilling

3.4.1 Environmental Setting/Affected Environment

The following sections describe the environmental setting for biological resources in proximity to the project site. Emphasis is placed on biological communities and species that may be affected by construction of the proposed project. More general descriptions are provided for areas that would receive recycled water from the proposed project such as agricultural lands and Refuges.

For the purposes of this section, the "Study Area" refers to the potential footprint of both action alternatives including all construction areas, staging areas, access roads, and areas that would be temporarily or permanently disturbed. The Study Area is shown in **Figure 3.4-1,** Sheets 1-17. Note that these figures distinguish preliminary locations where open-cut construction and trenchless construction techniques (e.g., horizontal directional drilling, micro-tunneling) would be employed. In general, trenchless construction techniques would be used in environmentally sensitive areas (e.g., stream crossings, riparian areas) to minimize the potential for disturbance of sensitive resources.

For the purposes of this section, the "Potentially Affected Area" includes the geographic extent of project actions that may affect biological resources. The Potentially Affected Area includes the Study Area, land within the DPWD's service area, and the CVPIA-designated wildlife Refuges.

Regional Setting

The Study Area is situated in the northwestern portion of the San Joaquin Valley. The San Joaquin River, bisects the Study Area. The Study Area generally has gently sloping terrain. Elevations around the San Joaquin River are approximately 50 to 60 ft above mean sea level (msl), and gradually increase to approximately 180 ft above msl near the DMC.

Historically, land adjacent to the river was characterized by a complex network of sloughs and channels (USGS 1952), which supported a mosaic of habitats including riparian forest and scrub, freshwater wetlands, alkali scrub, and alkali flats (JSA 1998, FWUA and NRDC 2002, CDFW 2014). The completion of Friant Dam near Fresno in 1942 controlled the flow of the San Joaquin River, and within the decades that followed much of the land adjacent to the river was converted to agriculture. The landscape is now dominated by agriculture and agriculture-related business economies. Other land uses in the Study Area include rural residential, wastewater treatment facilities, flood control (levees), transportation, and open space.

Figure 3.4-1: Biological Study Area (1 of 17)

Figure 3.4-1: Biological Study Area (2 of 17)

Figure 3.4-1: Biological Study Area (3 of 17)

Figure 3.4-1: Biological Study Area (4 of 17)

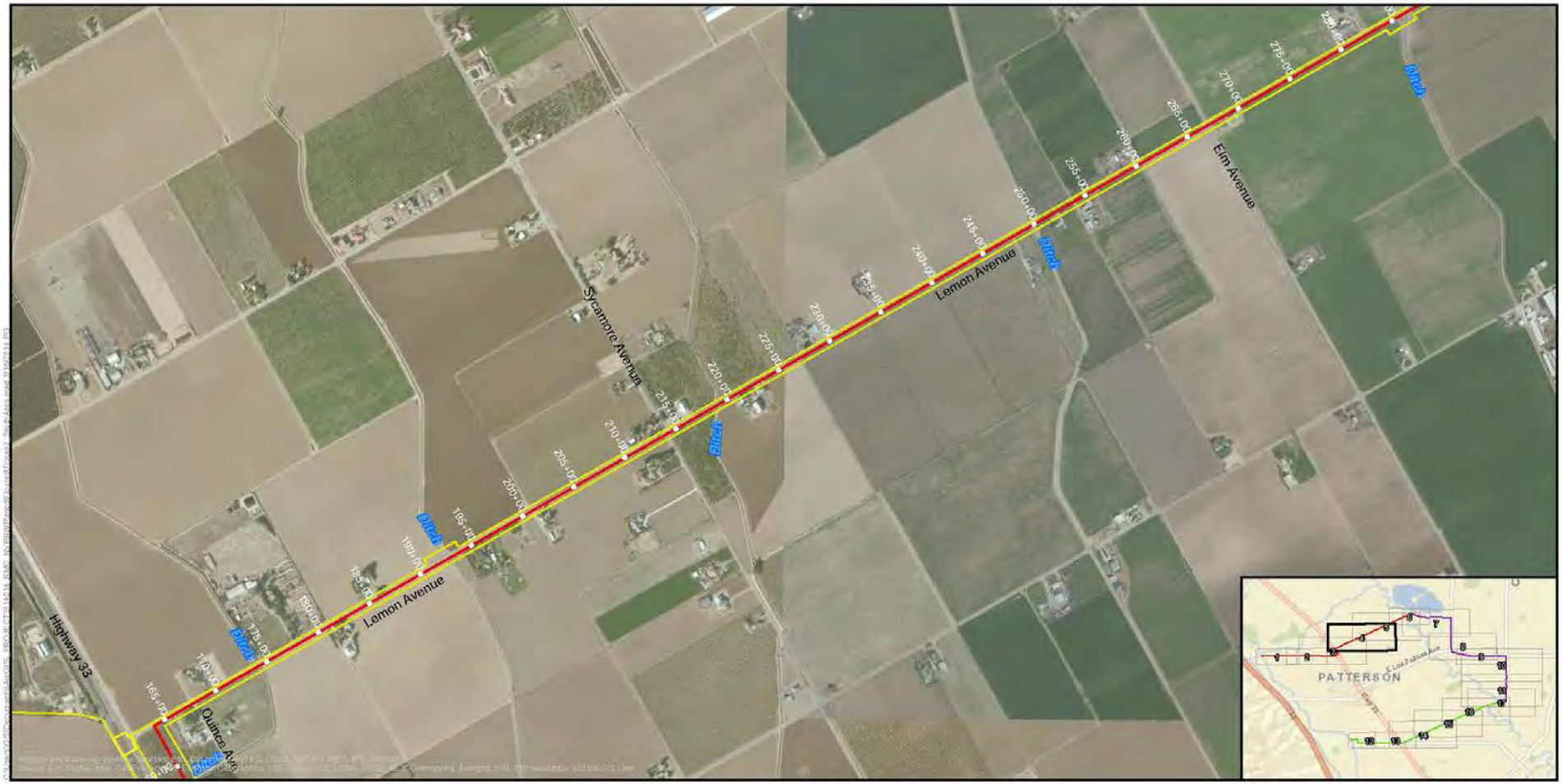


Figure 3.4-1: Biological Study Area (5 of 17)

Figure 3.4-1: Biological Study Area (6 of 17)

Figure 3.4-1: Biological Study Area (7 of 17)

N

0 500 1,000 2,000
Feet

Horizon WATER and ENVIRONMENT

NVRRWP Routes
- North Route
- Turlock-Modesto Link Segment
- South Route (Pomegranate)

Note
Alternative 1 consists of North Route + Turlock-Modesto Link Segment.
Alternative 2 consists of North Route + South Route.

Construction Method
- Open-cut Construction
- Trenchless Construction

- Tree
- Tricolored Blackbird breeding colony
  Source: UC Davis 2014
- Photo Location and View Direction

North Valley Regional Recycled Water Program

Figure 3.4-1
Biological Study Area

Sheet 7 of 17

Figure 3.4-1: Biological Study Area (8 of 17)

Figure 3.4-1: Biological Study Area (9 of 17)

Figure 3.4-1: Biological Study Area (10 of 17)

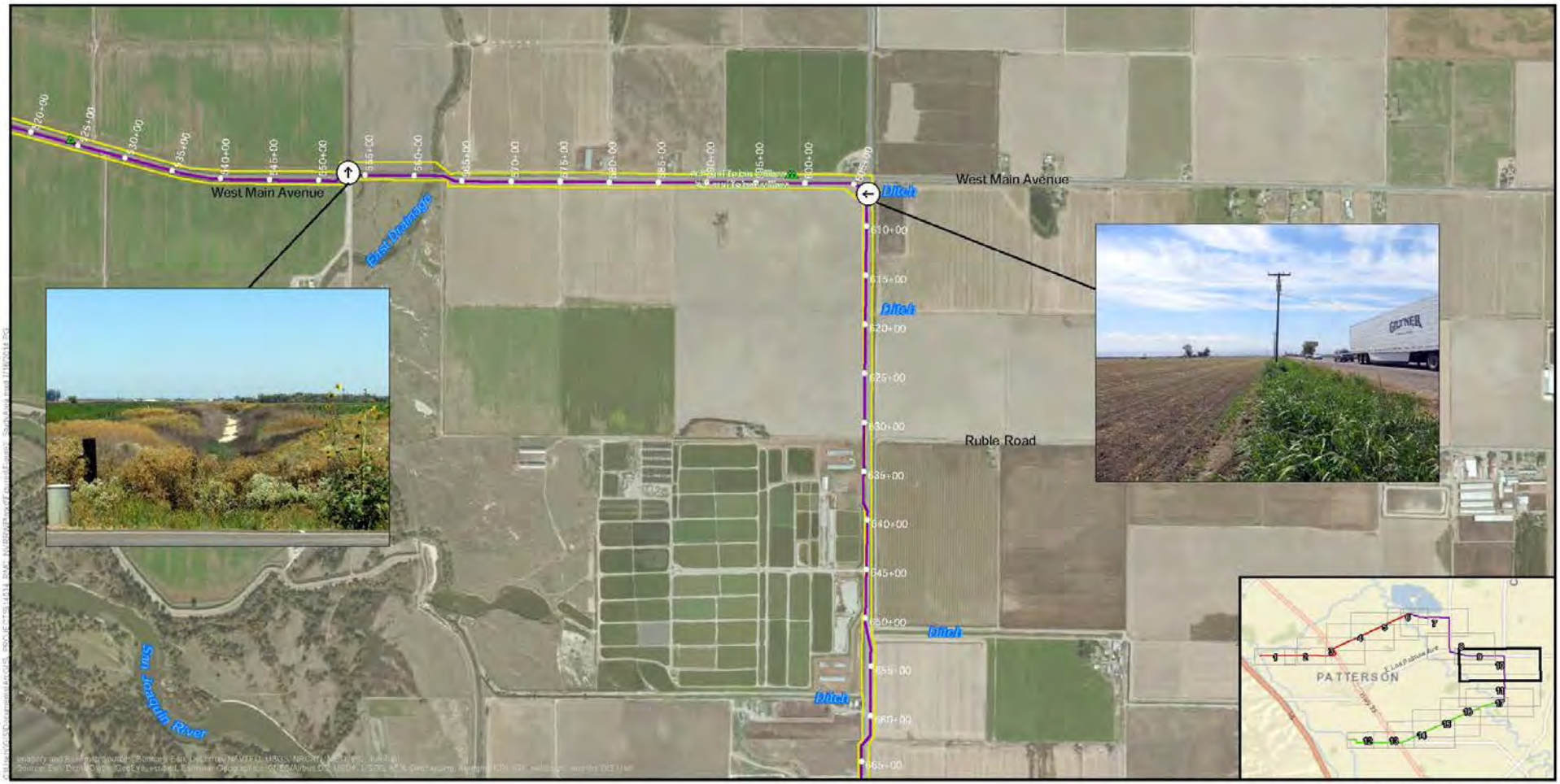


Figure 3.4-1: Biological Study Area (11 of 17)

Figure 3.4-1: Biological Study Area (12 of 17)

Figure 3.4-1: Biological Study Area (13 of 17)

Figure 3.4-1: Biological Study Area (14 of 17)

Figure 3.4-1: Biological Study Area (15 of 17)

Figure 3.4-1: Biological Study Area (16 of 17)

Figure 3.4-1: Biological Study Area (17 of 17)

The following section provides descriptions of biological communities in the Study Area. The descriptions presented below do not follow one specific classification system (e.g., Holland 1986, Sawyer et al. 2009), rather they draw from several resources to best communicate the characteristics of the resources present in the Study Area. Wildlife typically associated with these biological communities is also described below.

Terrestrial Communities

Agricultural Lands

Agricultural lands within and adjacent to the Study Area include flood irrigated pastures, orchards, and row crops. Pastures are typically cultivated in alfalfa (*Medicago sativa*), rescue grass (*Bromus catharticus*), Johnson's grass (*Sorghum halepense*), tall fescue (*Festuca arundinaceae*), and Italian ryegrass (*Festuca perennis*). The primary orchard crops in the vicinity of the Study Area are apricot (*Prunus armeniaca*), English walnut *(Juglans regia*), and almond (*Prunus dulcis*) cultivars (City of Patterson 2010). Row crops include broccoli (*Brassica oleracea*), corn (*Zea mays*), and tomatoes (*Solanum lycopersicum*), among others.

Flood irrigated pastures provide food, cover, and nesting grounds for wildlife species; the value of the habitat varies with crop type and agricultural practices. Bird diversity can be high in irrigated pastures (Hartman and Kyle 2010). Species commonly utilizing pasture lands include red-winged blackbird (*Agelaius phoeniceus*), Brewer's blackbird (*Euphagus cyanocephalus*), western meadowlarks (*Sturnella neglecta*), European startling (*Sturnus vulgaris*), house finch (*Carpodacus mexicanus*), killdeer (*Charadrius vociferous*), American crow (*Corvus brachyrhynchos*), and American kestrel (*Falco sparverius*). Some pasture lands and crop fields provide suitable breeding habitat for northern harrier (*Circus cyaneus*). Small mammals in flood irrigated pasture and row crops provide important prey resources for raptors such as red-tailed hawk (*Buteo jamaicensis*) and Swainson's hawk (*Buteo swainsoni*).

In orchards, the understory vegetation that provides food and cover for wildlife is generally removed, limiting the abundance and diversity of wildlife species. Species such as the side-blotched lizard (*Uta stansburiana*) can occur in this habitat type. American crow and yellow-billed magpies (*Pica nuttalli*), which forage on nut crops, are often present (City of Patterson 2010).

Ruderal

Much of the Study Area is situated within access roads and road shoulders that support a ruderal vegetation community. This vegetation type is characterized by early colonizing species of disturbed and degraded areas. Community composition includes non-native annual grasses such as mouse barley (*Hordeum murinum* ssp*. leporinum*), rip-gut brome (*Bromus diandrus*), and red brome (*B. madritensis* ssp. *rubens*). Other species present within this community type include non-native, often invasive thistle species such as spiny sow's thistle (*Sonchus asper*), milk thistle (*Silybum marianum*), star thistles (*Centaurea* spp.) and Italian thistle (*Carduus pycnocephalus*). Although the ruderal plant community is generally limited to herbaceous species, there are several mature, native trees located in this community type along roadways, particularly along Jennings Road and West Main Avenue (**Figure 3.4-1,** Sheets 7 and 8).

Due to sparse vegetative cover and frequent disturbance, ruderal habitats provide limited value to wildlife. Species such as mourning dove (*Zenaida macroura*) and killdeer forage and nest in this community type. The mature trees along the roadways provide perches and nesting habitat for raptors such as red-tailed hawk.

Riparian Woodland

Valley Oak Riparian Forest

In the Study Area, valley oak (*Quercus lobata*) riparian forest occurs on the topographically higher portions of the San Joaquin River floodplain (**Figure 3.4-1**, Sheet 17, Station 1310+00) and along the large natural drainage to the west of the San Joaquin River (**Figure 3.4-1**, Sheet 16, Station 1270+00). This community type is characterized by large, mature valley oaks in the overstory. The canopy is open to semi-closed. Understory vegetation is generally limited to herbaceous species and vines. Non-native grasses are dominant in the understory along the San Joaquin River. Perennial pepperweed (*Lepidium latifolium*) is dominant in the understory along the channel to the west of the river.

Willow Riparian Woodland

Willow riparian woodland is the dominant community in the San Joaquin River corridor in the Study Area. This vegetation community can best be characterized as Black Willow thicket (Sawyer et al. 2009) or Willow Riparian (Moise and Hendrickson 2002). Black willow (or Gooding's willow, *Salix gooddingii*) composes a minimum of 50% of the canopy cover within this vegetation alliance (Sawyer et al. 2009). Fremont's cottonwood (*Populus fremontii*) may be a co-dominant in the overstory canopy. The shrub component of this vegetation type may be composed of willow species (*Salix lasiolepis*, *S. laevigata* and *S. lucida* ssp. *lasiandra*). Button willow (*Cephalanthus occidentalis*) may dominate along the river banks. Within the Study Area, black willow composes 70% or more of the overstory and button willow and young black willow dominate the shrub component; arroyo willow is also abundant. Various wetland and mesic graminoids (grasses and grass-like plants including rushes and sedges) and forbs are present in the understory depending on the depth to ground water and proximity to the river. Saturated soils and areas with shallow stagnant water are dominated by bulrush (*Schoenoplectus* spp.). River banks and open water support the invasive water hyacinth (*Eichhornia crassipes*) and floating primrose willow (*Ludwigia peploides*). Unsaturated soils located outside the lower floodplain of the river are dominated by mugwort (*Artemisia douglasiana*), stinging nettle (*Urtica dioica*), and poison hemlock (*Conium maculatum*).

Riparian woodlands provide cover, food, and nesting habitat for a variety of wildlife species. Raptor species such as great horned owl (*Bubo virginianus*), red-tailed hawk, red-shouldered hawk (*Buteo lineatus*), Swainson's hawk, white-tailed kite (*Elanus leucurus*), and American kestrel may nest and forage in riparian woodland. Passerine species such as belted kingfisher (*Megaceryle alcyon*), downy woodpecker (*Picoides pubescens*), northern flicker (*Colaptes auratus*), ash-throated flycatcher (*Myiarchus cinerascens*), oak titmouse (*Baeolophus inornatus*), black phoebe (*Sayornis nigricans*), bushtit (*Psaltriparus minimus*), Bewick's wren (*Thryomanes bewickii*), lazuli bunting (*Passerina amoena*), blue grosbeak (*Passerina caerulea*), and species of goldfinches (*Carduelis* spp.) also commonly occur in this habitat. Mammals such as raccoon (*Procyon lotor*), desert cottontail (*Sylvilagus audubonii*), striped skunk (*Mephitis mephitis*), American beaver (*Castor canadensis*), and coyote (*Canis latrans*) are common in riparian woodlands.

Alkali Scrub/Alkali Flat

In the Study Area, alkali scrub occurs on the river side of the flood control levee near the Harding Drain (**Figure 3.4-1**, Sheet 17, Station 1335+00). This area is dominated by Australian saltbush (*Atriplex semibaccata*) and big saltbush (*Atriplex lentiformis*). An alkali flat/scrub community occurs adjacent to the Study Area on the south side of West Main Avenue (**Figure 3.4-1**, Sheet 9, Station 553+00 to 563+00). Dominant species in this area include iodine bush (*Allenrolfea occidentalis*), alkali heath (*Frankenia salina*), saltgrass (*Distichlis spicata*), Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*) and tumbling saltweed (*Atriplex rosea*). These areas are remnant patches of the expansive alkali habitats that were once present in the San Joaquin Valley.

Alkali habitats support a diversity of wildlife and often rare species, but the alkali habitats in the Study Area are small and disconnected from large tracts of this habitat type. Thus, they are unlikely to support rare species associated with these habitats such as San Joaquin whipsnake (*Masticophis flagellum ruddocki*) and San Joaquin kit fox (*Vulpes macrotis mutica*). More common generalists such as desert cottontail, side-blotched lizard, and various passerine birds are likely to be present.

Aquatic and Wetland Communities

Riverine

Riverine habitat in the Study Area includes the main channel of the San Joaquin River. In the Study Area, the river is a low gradient, sand/silt-bed channel with moderate to high sinuosity. Streamflow is perennial. The river is one of the most heavily dammed and diverted rivers in the state. While land use changes and water diversions have substantially reduced the flow and degraded habitat, the river remains an important wildlife corridor in the Central Valley. For example, Chinook salmon (*Oncorhynchus tshawytscha*) and a small number of steelhead (*O.mykiss*) migrate through this portion of the river to reach spawning habitat in the Merced River. White sturgeon (*Acipenser transmontanus*), and possibly green (*Acipenser medirostris*), also occur in this reach of the San Joaquin River (Jackson and Van Eenennaam 2013). Other native fish species that likely occur in this portion of the river include hardhead (*Mylopharodon conocephalus*), Pacific lamprey (*Entosphenus tridentatus*), Kern brook lamprey (*Lampetra hubbsi*), and prickly sculpin (*Cottus asper*). However, reduced flows, high water temperatures in the summer, and degraded water quality have adversely affected the habitat quality for many native fish species, resulting in a greater number of introduced species that are tolerant of these conditions. Introduced species include common carp (*Cyprinus carpio*), channel catfish (*Ictalurus punctatus*), white catfish (*Ictalurus catus),* fathead minnow (*Pimephales promelas*), red shiner (*Cypriella lutrensis*), and largemouth bass (*Micropteras salmoides*) (SJRRP 2013). Herpetofauna that commonly use the river and off-channel aquatic habitats include western pond turtle (*Actinemys marmorata*), Sierran treefrog (*Pseudacris sierra*), and American bullfrog (*Lithobates catesbeianus*).

Sloughs and Natural Drainages

As described previously in this section, land adjacent to the river was historically characterized by a complex network of sloughs and side channels. While most of these waterways have been filled, two large drainages that retain "natural" channel characteristics (e.g., sinuosity, non-uniform bed and banks) remain intact in the Study Area: one on the east side of the river, and one on the west. The drainage located east of the river flows adjacent to the City of Modesto Police Department shooting range, alkali habitat south of West Main Avenue, and the Modesto WTP spray fields (**Figure 3.4-1**, Sheets 7 to10). In general, this drainage has steep banks, which are armored with rip-rap in many locations. Large stands of bulrush are dispersed throughout the drainage. Floating aquatic vegetation such as Ludwigia (*Ludwigia peploides*) is also common.

The drainage to the west of the river (**Figure 3.4-1**, Sheet 16) has the characteristic of a backwater channel or abandoned slough. Flow is likely slow or stagnant throughout most of the year. This channel does not have abundant emergent or aquatic vegetation, but there is a considerable amount of woody debris. Streambanks are gently sloped.

The natural drainages likely support an assemblage of fishes tolerant of warm water and low oxygen conditions such as mosquitofish (*Gambusia affinis*). Ducks and wading birds, such as great blue heron (*Ardea herodias*) and egrets, forage in these drainages. Both drainages provide potentially suitable habitat for western pond turtle, and the drainage on the east side of the river provides potentially suitable habitat for giant garter snake (*Thamnophis gigas*). These drainages are also used by semi-aquatic rodents such as nutria (*Myocastor coypus*) or muskrat (*Ondatra zibethicus*).

Constructed or Modified Drainages

The project's proposed alignments cross numerous drainage facilities and irrigation ditches. These water conveyance features vary considerably in scale and character. Some of the larger drainage features, such as the Harding Drain, have channel widths of 10 to 20 feet and support tall emergent vegetation such as cattail (*Typha* spp.) and bulrush. The smaller drain facilities support less vegetation.

Wildlife species that may utilize the larger constructed drainage facilities are similar to those described for the natural drainages above. The large drainage facilities with tall emergent vegetation support nesting of species such as red-winged blackbird and marsh wren (*Cistothorus palustris*). They provide only marginally suitable habitat for western pond turtle and giant garter snake. The smaller drainage facilities provide more limited wildlife habitat, but some support invertebrate production and avian foraging.

Canals

Canals in the Study Area include the DMC and several small concrete-lined and un-lined irrigation canals. The DMC in the Study Area supports limited, if any, aquatic vegetation. Fish species such as striped bass (*Morone saxatilis*) and channel catfish are present in the canal. The DMC embankments support some ruderal vegetation. A small mammal burrow was observed along the embankment near Marshall Road (**Figure 3.4-1**, Sheet 12). No evidence of use by burrowing owls (*Athene cunicularia*) was observed during the reconnaissance survey, but this area is potentially suitable habitat for this species. Small concrete canals in the Study Area provide limited habitat for vegetation or wildlife (Horizon 2014b).

Alkaline Pool/Swale

An alkaline pool and a swale exist within the alkali flat/scrub community that occurs adjacent to the Study Area on the south side of West Main Avenue (**Figure 3.4-1**, Sheet 9, Stations 555+00 to 557+00). The pool has been disturbed by grazing and supports limited vegetation (See photo on **Figure 3.4-1**, Sheet 9). The alkali swale is also partially barren, but it supports more vegetation than the pool. Dominant vegetation in the swale consists of iodine bush (*Allenrolfea occidentalis*) and alkali heath (*Frankenia salina*). These wetlands provide potentially suitable habitat for vernal pool branchiopods. While the alkali pool would provide suitable breeding habitat for California tiger salamander (*Ambystoma californiense*), the surrounding landscape lacks suitable upland habitat for this species.

DPWD Service Area

Land within the DPWD service area includes agricultural lands, constructed and modified drainage facilities, and canals. The characteristics of these areas and associated biological resources are similar to the descriptions provided for the Study Area.

South of the Delta CPVIA-designated Wildlife Areas

As discussed in the *Chapter 2, Alternatives and Proposed Project/Action*, in addition to providing water to the DPWD service area, the proposed project would make recycled water available to the South of the Delta refuges to meet CPVIA requirements. Multiple Federal National Wildlife Areas (NWAs) and state wildlife areas (WAs), and one privately-managed complex in the Central Valley are designated as CVPIA units/refuges. These areas are generally open spaces containing habitat such as wetlands, native grasslands, riparian forests, and vernal pools that support a variety of fish and wildlife species and are an important part of the Pacific Flyway, a major migration route for migratory birds. A detailed description of the natural resources associated with the Refuges is provided in the *San Joaquin River National Wildlife Refuge Final Comprehensive Conservation Plan* (USFWS 2006).

3.4.2 Regulatory Framework

This section describes laws and regulations at the federal, state, and local level that may apply to the proposed project.

Federal Policies and Regulations

Clean Water Act

The Clean Water Act (CWA) is the primary federal law that protects the quality of the nation's surface waters, including lakes, rivers, and coastal wetlands.

Section 401

Section 401 of the CWA allows for evaluation of water quality when a proposed activity requiring a federal license or permit could result in a discharge to waters of the U. S. In California, the SWRCB and its nine RWQCBs issue water quality certifications. Each RWQCB is responsible for implementing Section 401 in compliance with the CWA and its water quality control plan (also known as a Basin Plan). Applicants for a federal license or permit to conduct activities that may result in the discharge to waters of the United States (including wetlands) must also obtain a Section 401 water quality certification to ensure that any such discharge will comply with the applicable provisions of the CWA. Compliance with Section 401 is required for all projects that have a federal component and may affect state water quality.

Section 404

CWA section 404 regulates the discharge of dredged and fill materials into waters of the United States (waters of the U.S.), which include all navigable waters, their tributaries, and some isolated waters, as well as some wetlands adjacent to the aforementioned waters (33 C.F.R. § 328.3). Areas typically not considered to be jurisdictional waters include non-tidal drainage and irrigation ditches excavated on dry land, artificially irrigated areas, artificial lakes or ponds used for irrigation or stock watering, small artificial water bodies such as swimming pools, and water-filled depressions (33 C.F.R. Part 328). Areas meeting the regulatory definition of waters of the U.S. are subject to the jurisdiction of the U.S. Army Corps of Engineers (USACE) under provisions of CWA section 404. Construction activities involving placement of fill into jurisdictional waters of the U.S. are regulated by the USACE through permit requirements. No USACE permit is effective in the absence of state water quality certification pursuant to section 401 of the CWA.

Rivers and Harbors Act - Section 10

Section 10 of the Rivers and Harbors Act (RHA) (33 United States Code [U.S.C.] § 401 et seq.) requires authorization from USACE for construction of any structure over, in, or under navigable waters of the U.S. The navigable length of the San Joaquin River currently includes 236 miles of the river from Sycamore Road (located 7 miles downstream from State Route [SR] 99 in Fresno County) to San Francisco Bay.

Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act (FWCA) of 1934, as amended (16 U.S.C. § 661 *et seq*.) is intended to promote conservation of fish and wildlife resources by preventing their loss or damage, and to provide for development and improvement of fish and wildlife resources in connection with water projects. Federal agencies undertaking water projects are required to fully consider recommendations made by USFWS, National Oceanic and Atmospheric Administration-National Marine Fisheries Service (NMFS), and State wildlife agencies when any waterbody is impounded, diverted, controlled, or modified for any purpose.

Based on surveys and investigations to be conducted by the federal and state agencies charged with administering wildlife resources, a report addressing any potential impacts to fish and wildlife species and appropriate mitigation measures would be provided to Reclamation for the Proposed Project. Compliance with the Fish and Wildlife Coordination Act will be coordinated with Endangered Species Act consultation, as described below.

Endangered Species Act

The Endangered Species Act (ESA) of 1973 (16 U.S.C. § 1531–1544) provides protection for animal and plant species that are in danger of extinction (endangered) and those that may become so in the foreseeable future (threatened). The USFWS and NMFS have regulatory authority over projects pursuant to the ESA that may affect the continued existence of a federally listed (threatened or endangered) species. Section 9 of the ESA prohibits the take of federally listed species. Take is defined under the ESA, in part, as killing, harming, or harassment of such species. Under federal regulations, take is further defined to include habitat modification or degradation where it actually results in death or injury to wildlife by substantially impairing essential behavioral patterns, including breeding, feeding, or sheltering. Several species listed under the ESA occur or have the potential to occur in the Study Area.

Section 7 of the ESA outlines procedures for federal interagency cooperation and participation in the conservation and recovery of federally listed species and designated critical habitat. Section 7(a)(2) requires federal agencies to consult with other federal agencies with regulatory authority to ensure that they are not undertaking, funding, permitting, or authorizing actions likely to jeopardize the continued existence of listed species or to destroy or adversely modify designated critical habitat. Critical habitat identifies specific areas that have the physical and biological features that are essential to the conservation of a listed species, and that may require special management considerations or protection.

Reclamation has been coordinating with USFWS and NMFS on an ongoing basis since early in the planning process to incorporate ESA section 7(a)(2) consultation for potential incidental take of listed species. An analysis of the anticipated effects of the proposed action upon listed species and designated critical habitats will be transmitted by Reclamation to USFWS and NMFS in a Biological Assessment (BA). The USFWS and/or NMFS may issue Biological Opinions (BO) to address those actions. This EIR/EIS will support the section 7(a)(2) consultation with USFWS and NMFS. Reclamation will not initiate any action that would affect a species Federally listed as endangered or threatened, without first completing the appropriate consultation(s) with USFWS or NMFS and receiving formal notice that the action would not jeopardize the continued existence of the listed species or adversely modify designated critical habitat.

Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) of 1976 is the primary act governing federal management of fisheries in federal waters, from the 3-nautical-mile state territorial sea limit to the outer limit of the U.S. Exclusive Economic Zone. It establishes exclusive U.S. management authority over all fishing within the Exclusive Economic Zone, all anadromous fish throughout their migratory range except when in a foreign nation's waters, and all fish on the continental shelf. The Magnuson-Stevens Act establishes eight Regional Fishery Management Councils responsible for the preparation of fishery management plans to achieve the optimum yield from U.S. fisheries in their regions. The act also requires federal agencies to consult with NMFS on actions that could damage Essential Fish Habitat (EFH). EFH includes those habitats that support the different life stages of each managed species. A single species may use many different habitats throughout its life to support breeding, spawning, nursery, feeding, and protection functions. EFH can consist of both the water column and the underlying surface (e.g., streambed) of a particular area. The San Joaquin River in the Study Area is designated EFH for Chinook salmon.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) (Title 16, U.S.C., Part 703) implements various treaties and conventions between the U.S., Canada, Japan, Mexico, and the former Soviet Union for the protection of migratory birds.. Under the MBTA, it is illegal for anyone to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or the parts, nests, or eggs of such a bird except under the terms of a valid permit issued pursuant to federal regulations (16 U.S.C.

703). The regulatory definition of *take*, as defined by 50 C.F.R. 10.12, *means to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt hunt, shoot, wound, kill, trap, capture, or collect.* As such, *take* under the MBTA does not include the concepts of harm and harassment as defined under ESA. The MBTA defines migratory birds broadly; all covered birds in this Conservation Strategy are considered migratory birds under the MBTA.

The USFWS is responsible for overseeing compliance with the MBTA. On December 8, 2004, the U.S. Congress passed the Migratory Bird Treaty Reform Act (Division E, Title I, Section 143 of the Consolidated Appropriations Act, 2005, PL 108–447), which excludes all migratory birds non-native or human-introduced to the U.S. or its territories. It defines a native migratory bird as a species present within the U.S. and its territories as a result of natural biological or ecological processes. The USFWS published a list of the bird species excluded from the MBTA on March 15, 2005 (70 FR 12710).

Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act prohibits the taking or possession of and commerce in bald and golden eagles, with limited exceptions (16 U.S.C. 668). Under the Bald and Golden Eagle Protection Act, it is a violation to "…take, possess, sell, purchase, barter, offer to sell, transport, export or import, at any time or in any manner, any bald eagle commonly known as the American eagle, or golden eagle, alive or dead, or any part, nest or egg, thereof…". *Take* is defined to include pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, destroy, molest, and disturb. *Disturb* is further defined in 50 C.F.R. Part 22.3 as "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior."

Public Law 102-575, Title 34, Central Valley Project Improvement Act (CVPIA)

The CVPIA, a multipurpose water legislation, was signed into law October 30, 1992. Previously referred to as H.R. 429, Public Law 102-575 contains 40 separate titles providing for water resource projects throughout the West. Title 34 of the CVPIA mandates changes in management of the Central Valley Project, particularly for the protection, restoration, and enhancement of fish and wildlife.

Ten major water management areas of change include: 800,000 acre-feet of water dedicated to fish and wildlife annually; tiered water pricing applicable to new and renewed contracts; water transfers provision, including sale of water to users outside the CVP service area; special efforts to restore anadromous fish populations by 2002; restoration fund financed by water and power users for habitat restoration and enhancement and water and land acquisitions; no new water contracts until fish and wildlife goals achieved; no contract renewals until completion of a Programmatic EIS; terms of contracts reduced from 40 to 25 years with renewal at the discretion of the Secretary of the Interior; installation of the temperature control device at Shasta Dam; implementation of fish passage measures at Red Bluff Diversion Dam; firm water supplies for Central Valley wildlife refuges; and development of a plan to increase CVP yield (Reclamation 2014).

Public Law 105-57, National Wildlife Refuge System Improvement Act of 1997

USFWS implements the mandates of Public Law 105-57, the National Wildlife Refuge System Improvement Act of 1997. The Act amends the National Wildlife Refuge System Administration Act of 1966 in a manner that provides an "Organic Act" for the Refuge System. USFWS is responsible for developing comprehensive conservation plans to guide the management and resources of each individual refuge. More than 545 national wildlife refuges and thousands of waterfowl production areas across the United States teem with millions of migratory birds, serve as havens for hundreds of endangered species, and host an enormous variety of other plants and animals. As described further in *Chapter 2, Alternatives*

and Proposed Project/Action, the proposed project would make recycled water available to some CVPIA-designated refuges.

Executive Orders

Several Executive Orders (EOs) have been issued providing direction to federal agencies regarding invasive species, floodplain management, and protection of wetlands, as discussed below.

EO 13112: Invasive Species

EO 13112 directs all federal agencies to prevent and control introductions of invasive non-native species in a cost-effective and environmentally sound manner to minimize their economic, ecological, and human health impacts. As directed by this EO, a national invasive species management plan guides federal actions to prevent, control, and minimize invasive species and their impacts (NISC 2008). To support implementation of this plan, USACE released a memorandum describing the *U.S. Army Corps of Engineers Invasive Species Policy* (USACE 2009). This policy includes addressing invasive species effects in impact analysis for civil works projects.

EO 11990: Protection of Wetlands

EO 11990 directs federal agencies to provide leadership and take action to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands in implementing civil works.

State Policies and Regulations

California Environmental Quality Act—Sections 15065 and 15380

Title 14, section 15065 of the California Code of Regulations (CEQA Guidelines) requires that a lead agency shall determine whether a project may have a significant effect on the environment and require an EIR to be prepared for the project if there is substantial evidence, in light of the whole record, that the project has the potential to substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, and/or substantially reduce the number or restrict the range of an endangered, rare or threatened species.

Title 14, section 15380 of the California Code of Regulations defines the terms “species”, “endangered”, “rare”, and “threatened” as they pertain to CEQA. Section 15380 also provides a greater level of consideration for state-listed or federally-listed species, and for any species that can be shown to meet the criteria for listing, but which has not yet been listed. The criteria for considering a species endangered, rare, or threatened under CEQA are as follows:

- When its survival and reproduction in the wild are in immediate jeopardy from one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, disease, or other factors; or
- Although not presently threatened with extinction, the species is existing in such small numbers throughout all or a significant portion of its range that it may become endangered if its environment worsens; or
- The species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range and may be considered "threatened" as defined in the ESA.

Species that meet the criteria listed above are often considered “Species of Special Concern” by the California Department of Fish and Wildlife (CDFW). Species of Special Concern is an administrative designation and carries no formal legal status. Generally, Species of Special Concern should be included in an analysis of project impacts if they can be shown to meet the criteria of sensitivity outlined in section 15380 of the CEQA Guidelines. However, some older lists of Species of Special Concern were not

developed using criteria relevant to CEQA, and the information used in generating those lists is out of date. Therefore, the current circumstances of each unlisted Species of Special Concern must be considered in the context of section 15380 criteria and not automatically assumed to be rare, threatened or endangered.

California Fish and Game Commission

The California Constitution establishes the California Fish and Game Commission (Commission) (California Constitution Article 4, § 20). The Fish and Game Code delegates the power to the Commission to regulate the taking or possession of birds, mammals, fish, amphibian and reptiles (Fish & G. Code, § 200). The Commission has adopted regulations setting forth the manner and method of the take of certain fish and wildlife in the California Code of Regulations, Title 14. Likewise, the Commission has exclusive statutory authority under the Fish and Game Code to designate species as endangered or threatened under the California Endangered Species Act (CESA) (Fish & G. Code, § 2070). Under the Commission's general regulatory powers function, it establishes seasons, bag limits, and methods of take for game animals and sport fish (i.e., hunting and fishing regulations).

California Fish and Game Code

Section 700 - Species Protection

The Fish and Game Code established CDFW (Fish & G. Code, § 700) and states that the fish and wildlife resources of the state are held in trust for the people of the state by and through the CDFW (Fish & G. Code, § 711.7, subd. (a)). Fish and Game Code section 1802 states that CDFW has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable populations of those species. All licenses, permits, tag reservations, and other entitlements for the take of fish and game authorized by the Fish and Game Code are prepared and issued by CDFW (Fish & G. Code, § 1050, subd. (a)). Provisions of the Fish and Game Code establish special protection to certain enumerated species, such as section 5515, which lists fully protected fish species.

Section 1602 – Lake or Streambed Alteration

Fish and Game Code section 1602 states that "an entity may not substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake" unless CDFW receives written notification regarding the activity and the entity pays the applicable fee. If CDFW determines that the activity may substantially adversely affect an existing fish or wildlife resource, an agreement is issued to the entity that includes reasonable measures necessary to protect the resource.

Section 1900-1913 – Native Plant Protection Act

The Native Plant Protection Act (NPPA) of 1977 (Fish & G. Code, §§ 1900-1913) directs CDFW to carry out the Legislature's intent to "preserve, protect and enhance rare and endangered plants in this state." The NPPA authorizes the Commission to designate plants as 'endangered' or 'rare' and prohibits 'take' of any such plants, except as authorized in limited circumstances.

CDFW and the California Native Plant Society (CNPS), a non-governmental organization, jointly maintain California Rare Plant Rank (CRPR) lists. These lists include plant species of concern in California. Vascular plants included on these lists are defined as follows:

- List 1: Plants considered extinct or extirpated in California.
- List 1B: Plants that are rare, threatened, or endangered in California and elsewhere.
- List 2: Plants that are rare, threatened, or endangered in California, but more common elsewhere.
- List 3: Plants about which more information is needed - review list.
- List 4: Plants of limited distribution - watch list.

Plants appearing on Lists 1 and 2 are, in general, considered to meet the CEQA Guidelines section 15380(b) criteria and adverse effects to these species may be considered significant. Impacts to plants that are on Lists 3 and 4 are also considered during CEQA review, although because these species are typically not as rare as those on Lists 1 and 2, impacts to them are less frequently considered potentially significant.

Section 2050 et seq. – California Endangered Species Act

CESA (Fish & G. Code, § 2050 et seq.) is intended to conserve, protect, restore, and enhance species designated as endangered or threatened, and their habitat (Fish & G. Code, § 2052). The Commission has exclusive statutory authority to designate species as endangered or threatened under CESA (California Constitution, article IV, § 20, subd. (b); Fish & G. Code, § 2070). Animal species designated as endangered or threatened under CESA are listed in California Code of Regulations, Title 14, section 670.5. Plant species designated as endangered or threatened under CESA, or designated as a rare plant species under the California Native Plant Protection Act (Fish & G. Code, § 1900 et seq.), are listed in California Code of Regulations, Title 14, section 670.2.

CESA directs all state agencies, boards, and commissions to seek to conserve endangered and threatened species, and to utilize their authority in furtherance of that policy (Fish & G. Code, § 2055). For purposes of CESA, "conserve," "conserving," and "conservation" mean to implement all methods and procedures necessary to increase the abundance of any endangered or threatened species to levels at which the protections provided by CESA are no longer necessary. These methods and procedures include, but are not limited to, all activities associated with scientific resources management, such as research; census; law enforcement; habitat acquisition; restoration and maintenance; propagation; live trapping; and transplantation; and, in the extraordinary case where population pressures within a given ecosystem cannot be otherwise relieved, may include regulated taking (Fish & G. Code, § 2061). CESA emphasizes that state agencies should not approve projects as proposed that would jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of habitat essential to the continued existence of those species if there are reasonable and prudent alternatives available consistent with conserving the species or its habitat that would prevent jeopardy (Fish & G. Code, § 2053).

Species designated as endangered or threatened under CESA, and species designated as candidates for listing or delisting under CESA, are subject to what is commonly known as CESA's "take" prohibition. In general, this prohibition provides that no person shall import into the state, or export out of the state, or take, possess, purchase, or sell within the state (or attempt to do any of those acts), any species, or any part or product thereof, designated by the Commission as protected under CESA, except as otherwise provided by law (Fish & G. Code, §§ 2080, 2085; see also Cal. Code Regs., Tit. 14, § 783.1). "Take" is defined specifically in the Fish and Game Code to mean "hunt, pursue, catch, capture, or kill," or an attempt to do any such act; violations of CESA's take prohibition are criminal misdemeanors under state law (Fish & G. Code, §§ 86, 12000; see also *Department of Fish and Game v. Anderson-Cottonwood Irrigation District* (1992) 8 Cal. App. 4th 1554). Unlike the ESA, CESA applies the take prohibitions to species under petition for listing (candidates) in addition to listed species. Section 2081 of the Fish and Game Code expressly allows CDFW to authorize, by permit, the incidental take of endangered, threatened, and candidate species if all of certain conditions are met.

Other Sections

Other sections of the Fish and Game Code describe protection for specific types of wildlife. For example, Fish and Game Code sections 3503, 3513, and 3800 (and other sections and subsections) protect native birds, including their active or inactive nests and eggs, from all forms of take ('take' means hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill [Fish & G. Code, § 86]). Raptors (i.e., eagles, falcons, hawks, and owls) and their nests are specifically protected in California under Fish

and Game Code section 3503.5, which states that it is "unlawful to take, possess, or destroy any birds in the order Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto." Certain species are designated as fully protected under Fish and Game Code sections 3511 (birds), 5515 (fish), 4700 (mammals), and 5050 (amphibians) and it is illegal to take these species. Non-game mammals are also protected by Fish and Game Code section 4150.

Porter-Cologne Water Quality Act

See *Section 3.11, Hydrology and Water Quality.*

National Pollutant Discharge Elimination System (NPDES) Permits

See *Section 3.11, Hydrology and Water Quality.*

Local Policies and Regulations

Stanislaus County General Plan

Stanislaus County has identified the following goals and policies in the Conservation/Open Space Element of the General Plan (1994) that are relevant to the proposed project:

GOAL ONE: Encourage the protection and preservation of natural and scenic areas throughout the County.

> Policy One Maintain the natural environment in areas dedicated as parks and open spaces.
>
> Policy Three Areas of sensitive wildlife and plant life (e.g., vernal pools, riparian habitats, flyways and other waterfowl habitats) including habitats and plant species listed in the General Plan Support Document or by state or federal agencies shall be protected from development.
>
> Policy Four Protect and enhance oak woodlands and other native hardwood habitat.

GOAL TWO: Conserve water resources and protect water quality in the County.

> Policy Five Protect groundwater aquifers and recharge areas, particularly those critical for the replenishment of reservoirs and aquifers.
>
> Policy Six Preserve vegetation to protect waterways from bank erosion and siltation.

GOAL TEN: Protect fish and wildlife species of the County.

> Policy Twenty-Nine Adequate water flows should be maintained in the County's rivers to allow salmon migration.
>
> > Implementation Measure 1. The County should continue to lobby the federal government to provide adequate water flow in the County's rivers to allow salmon migration.
>
> Policy Thirty Habitats of rare and endangered fish and wildlife species shall be protected.

City of Modesto General Plan

The City of Modesto Urban Area General Plan was adopted on October 14, 2008 (City of Modesto 2008). The City of Modesto is currently conducting environmental review on amendments to the 2008 Urban Area General Plan. The Jennings WTP is not within the boundaries of the Urban Area General Plan. The 2008 Urban Area General Plan states that:

> "*In the past, the city has relied upon Section 56742 a–b of the Government Code to annex properties noncontiguous to the city, for the purpose of establishing and expanding certain wastewater treatment facilities on Jennings Road, adjacent to the San Joaquin River. Annexation of all of the Wastewater Treatment Plant land is underway at the Jennings Road facilities.*

> *Because this site is approximately seven miles from the city limits it is not depicted graphically on the Land Use Diagram. Nevertheless, as long as Section 56742 a–b remains in effect, the city will continue to expand the treatment facilities, and annex the land to the city as appropriate and as needs dictate. The Sphere of Influence should reflect the ability of the City to take this action.*"

The 2008 Urban Area General Plan goes on to state that:

> "*The City will designate a riparian habitat preserve for the Jennings Road and Sutter Avenue wastewater facilities, where they adjoin the San Joaquin and Tuolumne Rivers, respectively, to foster the best conjunctive management of wastewater facilities. The Jennings Road and Sutter Avenue wastewater sites have been incorporated into the Tuolumne River Regional Park (TRRP) Master Plan, and the designation of riparian habitat preserves at these locations is consistent with provisions in the TRRP Master Plan. The designation of riparian preserves at these locations will help preserve open space and protect habitat for threatened and endangered species, including valley elderberry longhorn beetle and Swainson's hawk.*"

3.4.3 Special-status Species

Definitions and Methods of Assessment

Special-status plant and wildlife species refers to those species that meet one or more of the following criteria:

- Species that are listed as threatened or endangered under ESA (50 C.F.R. 17.12 for listed plants, 50 C.F.R. 17.11 for listed animals);
- Species that are candidates for possible future listing as threatened or endangered under ESA (76 FR 66370);
- Species that are listed or proposed for listing by the State of California as threatened or endangered under CESA (14 CCR 670.5);
- Plants listed as rare under the California Native Plant Protection Act of 1977 (Fish & G. Code, § 1900 et seq);
- California Rare Plant Rank (CRPR) List 1 and 2 species;
- Species that meet the definitions of rare or endangered under CEQA (CEQA Guidelines, § 15380); or
- Animals fully protected in California (Fish & G. Code, § 3511 [birds], 4700 [mammals], and 5050 [reptiles and amphibians]).

Background information on special-status plant and wildlife species with potential to occur in the Study Area was compiled from numerous sources including, but not limited to, the following:

- U.S. Fish and Wildlife Service (USFWS) List of Federal Endangered and Threatened Species that Occur in or May Be Affected by Projects in Stanislaus County as well as in the USGS 7.5 minute quadrangles for the Study Area, including Patterson, Westley, Brush Lake, Crow's Landing (USFWS 2014, **Appendix D)**;
- California Natural Diversity Database (CNDDB) and CNPS Inventory of Rare and Endangered Plants of California queries for the USGS 7.5 minute quadrangles within the Project Area and the quadrangles immediately adjacent to them, which are: Patterson, Westley, Brush Lake, Crow's Landing, Copper Mountain, Solyo, Vernalis, Ripon, Salida, Riverbank, Ceres, Hatch, Gustine, Newman, Orestimba Peak and Wilcox Ridge (**Appendix D**);
- City of Turlock Draft and Final Environmental Impact Report for the Harding Drain Bypass Project (City of Turlock 2004, City of Turlock 2005);
- eBird.org records for the Modesto Wastewater Treatment Plant and spray fields; and

- Horizon's field notes and reports from pre-construction surveys and construction monitoring for the Harding Drain Bypass Project (Horizon 2014a).

Tables 3.4-1 and 3.4-2 list the special-status plant and wildlife species known to occur in the vicinity of the Study Area, and **Figures 3.4-2 and 3.4.3** show the CNDDB occurrences of special-status plants and animals within a 5-mile radius of the Study Area.

The potential for special-status species to occur in the vicinity of the Study Area was evaluated according to the following criteria:

- **None:** indicates that the area contains a complete lack of suitable habitat, the local range for the species is restricted, and/or the species is extirpated in this region.
- **Not Expected**: indicates situations where suitable habitat or key habitat elements may be present but may be of poor quality or isolated from the nearest extant occurrences. Habitat suitability refers to factors such as elevation, soil chemistry and type, vegetation communities, microhabitats, and degraded/significantly altered habitats.
- **Possible**: indicates the presence of suitable habitat or key habitat elements that potentially support the species.
- **Present**: indicates the species was either observed directly or its presence was confirmed by diagnostic signs (i.e. tracks, scat, burrows, carcasses, castings, prey remains, etc) during field investigations or in previous studies in the area.

The Study Area was divided into two areas for the evaluation:

1. Potential for special-status species to occur in areas with open-cut construction; and
2. Potential for special-status species to occur within trenchless construction areas or adjacent habitats.

In general, the proposed project intends to avoid the use of open-cut construction in areas with potentially sensitive biological or hydrologic resources (i.e. areas without wetlands and/or habitat for special-status species). Trenchless construction techniques would be used in environmentally sensitive areas. The impact analysis presented in *Section 3.4.4* considers the potential for direct and indirect impacts to special-status species and their habitats. Brief summaries of the life history for special-status species with the potential to be impacted by the proposed project are provided in **Appendix D**.

3.4.4 Impact Analysis/Environmental Consequence

Analysis Approach

The proposed project may impact biological resources through the direct or indirect disturbance, modification, or destruction of habitat such that it results in death, injury or harassment of individuals or populations of plant or animal species, or impedes or prevents the dispersal of individuals or populations of special-status species. Potential impacts on existing biological resources were evaluated by comparing the quantity and quality of habitats present in the Study Area under baseline conditions to anticipated conditions after implementation of the project activities. Direct and indirect impacts on special-status species were assessed based on the potential for the species or their habitat to be disturbed or enhanced by implementation of the proposed project.

In general, once construction is complete, operation and maintenance of the proposed project, as described in *Chapter 2, Alternatives and Proposed Project/Action,* would not involve disturbance to biological resources. Unless otherwise stated below, impacts associated with operation and maintenance are considered unlikely or less than significant, and are not discussed further.

This document is prepared to comply with both CEQA and NEPA regulations. Any determination of "significance" to species from the Proposed Project relates to CESA compliance, and does not necessary relate to potential significant impacts to FESA-protected species.

Criteria for Determining Significance/Consequence

For the purposes of this analysis, the proposed project would result in a significant impact or potential impact to biological resources if it would meet one or more of the following criteria under CEQA or NEPA, respectively:

- Have a substantial or potential adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW, USFWS, or NMFS;
- Have a substantial or potential adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by CDFW, USFWS, or NMFS;
- Have a substantial or potential adverse effect on federally protected wetlands as defined by Section 404 of the CWA (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;
- Interfere substantially or potentially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites; or
- Conflict with local policies or ordinances protecting biological resources, or conflict with the provisions of an adopted Habitat Conservation Plan (HCP) or Natural Community Conservation Plan (NCCP).

The analysis considers both species and their habitats. A *less than significant or unlikely to* impact generally refers to a situation where there is a measurable impact, but the impact is not likely to result in an adverse outcome for the survival or fitness of a particular species, or a widespread or long-lasting adverse effect on a natural community. Conversely, an impact would be considered *potentially significant* or adverse if it may substantially decrease the likelihood of survival or fitness of a particular species (e.g., substantial decrease in a local population size or extirpation), or result in widespread or long-lasting adverse effects on a natural community. For impacts found to be "potentially significant", mitigation measures are proposed. Any impact that remains significant after application of all feasible mitigation is considered *significant and unavoidable*.

Impacts and Mitigation Measures

Impact BIO-1: Effects on special-status plants.

Table 3.4-1 lists the special-status plant species known to occur in the vicinity of the Study Area, and **Figure 3.4-2** shows the CNDDB occurrences of special-status plants within a 5-mile radius of the Study Area. Two CNDDB records of special-status plants are located in the Study Area: one for vernal pool smallscale (*Atriplex persistens*) and one for Delta button celery (*Eryngium racemosum*) (**Figure 3.4-2**).

Table 3.4-1: Special-Status Plant Species

Name	Federal listing status	State listing status	Rare Plant Rank	General Habitat	Micro Habitat and Flowering Period	Potential to Occur in Open-cut Construction Areas	Potential to Occur in Trenchless Construction Areas or Adjacent Habitats
red-flowered bird's-foot trefoil *Acmispon rubriflorus*	None	None	1B.1	Cismontane woodland, valley and foothill grassland.	Known from only four disjunct occurrences. The closest occurrence is along Del Puerto Canyon Road, west of Interstate 5 at elevations between 200 - 425 m. Flowers April - June.	None. Suitable habitat is not present. Project Area is not within species known elevation range.	None. Suitable habitat is not present. Project Area is not within species known elevation range.
Sharsmith's onion *Allium sharsmithiae*	None	None	1B.3	Cismontane woodland, chaparral.	Rocky, serpentine slopes. 400 - 1200 m. Flowers March - May.	None. Suitable habitat is not present. Project Area is not within species known elevation range.	None. Suitable habitat is not present. Project Area is not within species known elevation range.
large-flowered fiddleneck *Amsinckia grandiflora*	FE	SE	1B.1	Cismontane woodland, valley and foothill grassland.	Annual grassland in various soils. 275 - 550 m. Flowers April - May.	None. Suitable habitat is not present. Project Area is not within species known elevation range.	None. Suitable habitat is not present. Project Area is not within species known elevation range.
alkali milk-vetch *Astragalus tener var. tener*	None	None	1B.2	Alkali playa, valley and foothill grassland, vernal pools.	Low ground, alkali flats, and flooded lands; in annual grassland or in playas or vernal pools. 1-60 m. Flowers March to June.	None. Suitable habitat is not present in open-cut areas.	Possible. Species is known to occur in the vicinity of the Project Area along the San Joaquin River (SJR). Potential habitat for this species occurs in trenchless construction areas crossing the SJR and in alkaline flats adjacent to the Project Area between Stations 553+00 to 563+00. Species was not observed during 2014 reconnaissance surveys (Horizon 2014b).
heartscale *Atriplex cordulata*	None	None	1B.2	Chenopod scrub, valley and foothill grassland, meadows.	Alkaline flats and scalds in the Central Valley, sandy soils. 1- 560 m. Flowers April - October.	None. Suitable habitat is not present in open-cut areas.	Possible. Potential habitat for this species occurs in alkaline flats adjacent to the Project Area between Stations 553+00 to 563+00. Species was not observed during 2014 reconnaissance surveys (Horizon 2014b).

Name	Federal listing status	State listing status	Rare Plant Rank	General Habitat	Micro Habitat and Flowering Period	Potential to Occur in Open-cut Construction Areas	Potential to Occur in Trenchless Construction Areas or Adjacent Habitats
brittlescale *Atriplex depressa*	None	None	1B.2	Chenopod scrub, Meadows and seeps, Playas, Valley and foothill grassland, Vernal pools.	Alkaline clay. Flowers April - October.	None. Suitable habitat is not present in open-cut areas.	Possible. Potential habitat for this species occurs in alkaline flats adjacent to the Project Area between Stations 553+00 to 563+00. Species was not observed during 2014 reconnaissance surveys (Horizon 2014b).
lesser saltscale *Atriplex minuscula*	None	None	1B.1	Chenopod scrub, playas, valley and foothill grassland.	In alkali sink and grassland in sandy, alkaline soils. 20-100 m. Flowers May - October.	None. Suitable habitat is not present in open-cut areas.	Possible. Potential habitat for this species occurs in alkaline flats adjacent to the Project Area between Stations 553+00 to 563+00. Species was not observed during 2014 reconnaissance surveys (Horizon 2014b).
vernal pool smallscale *Atriplex persistens*	None	None	1B.2	Vernal pools.	Alkaline vernal pools. 10-115 m. Flowers June to October.	None. Suitable habitat is not present in open-cut areas.	Possible. Potential habitat for this species occurs in alkaline pools/swales adjacent to the Project Area between Stations 553+00 to 563+00. Species was not observed during 2014 reconnaissance surveys (Horizon 2014b).
big tarplant *Blepharizonia plumosa*	None	None	1B.1	Valley and foothill grassland.	Dry slopes in annual grassland. Clay to clay-loam soils; usually on slopes and often in burned areas. 30-505 m. Flowers July to October.	None. Suitable habitat is not present.	None. Suitable habitat is not present.
Chinese Camp brodiaea *Brodiaea pallida*	FT	SE	1B.1	Valley and foothill grassland in the North to Central Sierra Foothills.	In flat, rocky, intermittent streambed on serpentine soils. 160–390 m. Flowers May to June.	None. Suitable habitat is not present. Project Area is not within species known elevation range.	None. Suitable habitat is not present. Project Area is not within species known elevation range.
round-leaved filaree *California macrophylla*	None	None	1B.1	Cismontane woodland, valley and foothill grassland.	Clay soils. 15-1200 m. Flowers March to May.	None. Suitable habitat is not present in open-cut areas.	Not expected. Marginally suitable habitat is present in the in the trenchless construction areas crossing the SJR.
Santa Cruz Mountains pussypaws *Calyptridium parryi var. hesseae*	None	None	1B.1	Chaparral, cismontane woodland.	Sandy or gravelly openings. 305-1530 m. Flowers May to August.	None. Suitable habitat is not present. Project Area is not within species known elevation range.	None. Suitable habitat is not present. Project Area is not within species known elevation range.

Name	Federal listing status	State listing status	Rare Plant Rank	General Habitat	Micro Habitat and Flowering Period	Potential to Occur in Open-cut Construction Areas	Potential to Occur in Trenchless Construction Areas or Adjacent Habitats
chaparral harebell *Campanula exigua*	None	None	1B.2	Chaparral.	Rocky sites, usually on serpentine in chaparral. 275-1250 m. Flowers May to June.	None. Suitable habitat is not present. Project Area is not within species known elevation range.	None. Suitable habitat is not present. Project Area is not within species known elevation range.
succulent (=fleshy) owl's-clover *Castilleja campestris ssp. succulenta*	FT	SE	1B.2	Vernal pools, valley and foothill grassland.	Moist places, often in acidic soils. 25-750 m.	None. Suitable habitat is not present.	None. Suitable habitat is not present.
Lemmon's jewelflower *Caulanthus lemmonii*	None	None	1B.2	Valley and foothill grassland, chaparral and scrub vegetation. Coast ranges, San Francisco Bay Area and Southwestern San Joaquin Valley.	80-1220 m.Flowers March to May.	None. Suitable habitat is not present. Project Area is not within species known elevation range.	None. Suitable habitat is not present. Project Area is not within species known elevation range.
Hoover's spurge *Chamaesyce hooveri*	FE	ST	1B.2	Vernal pools, valley and foothill grassland.	Vernal pools on volcanic mudflow or clay substrate. 25-130 m. Flowers July to September.	None. Suitable habitat is not present.	None. Suitable habitat is not present.
hispid bird's-beak *Chloropyron molle ssp. hispidum*	None	None	1B.1	Meadows and seeps, playas, valley and foothill grassland.	In damp alkaline soils, especially in alkaline meadows and alkali sinks with Distichlis. 1-155 m. Flowers June to September.	None. Suitable habitat is not present in open-cut areas.	Possible. Potential habitat for this species occurs in alkaline flats adjacent to the Project Area between Stations 553+00 to 563+00. Species was not observed during 2014 reconnaissance surveys (Horizon 2014b).
slough thistle *Cirsium crassicaule*	None	None	1B.1	Chenopod scrub, marshes and swamps, riparian scrub.	Sloughs, riverbanks, and marshy areas. Primarily freshwater wetlands. 3-100 m. Flowers May to August.	None. Suitable habitat is not present in open-cut areas.	Possible. Potential habitat for this species includes the SJR crossings, natural drainages, and alkali scrub.
Hospital Canyon larkspur *Delphinium californicum ssp. interius*	None	None	1B.2	Cismontane woodland, chaparral, coastal scrub.	In wet, boggy meadows, openings in chaparral and in canyons. 195-1,095 m. Flowers April to June.	None. Suitable habitat is not present. Project Area is not within species known elevation range.	None. Suitable habitat is not present. Project Area is not within species known elevation range.

Name	Federal listing status	State listing status	Rare Plant Rank	General Habitat	Micro Habitat and Flowering Period	Potential to Occur in Open-cut Construction Areas	Potential to Occur in Trenchless Construction Areas or Adjacent Habitats
Santa Clara Valley dudleya *Dudleya setchelli*	FE	None	1B.2	Valley and foothill grassland, cismontane woodland.	On rocky serpentine outcrops and on rocks within grassland or woodland. 60-455 m. Flowers April to October.	None. Suitable habitat is not present. Project Area is not within species known elevation range.	None. Suitable habitat is not present. Project Area is not within species known elevation range.
Delta button-celery *Eryngium racemosum*	None	SE	1B.1	Riparian scrub.	Seasonally inundated depressions in floodplains on clay soils. 3-30 m. Flowers from June to October.	None. Suitable habitat is not present in the Project Area.	Possible. Potential habitat for this species includes the SJR crossings, however clay soils required for species was not observed during 2014 reconnaissance surveys (Horizon 2014b).
spiny-sepaled button-celery *Eryngium spinosepalum*	None	None	1B.2	Vernal pools, valley and foothill grassland.	Vernal pools, within grasslands, at some sites found on clay soil of granitic origin;. 80-1,025 m. Flowers April to May.	None. Suitable habitat is not present. Project Area is not within species known elevation range.	None. Suitable habitat is not present. Project Area is not within species known elevation range.
diamond-petaled California poppy *Eschscholzia rhombipetala*	None	None	1B.1	Valley and foothill grassland.	fallow fields and open places on alkaline, clay slopes and flats. 0 - 975 m. Flowers March to April.	Not expected. Minimal habitat is present in the Project Area.	Not expected. Minimal habitat is present in the Project Area.
San Joaquin spearscale *Extriplex joaquinana*	None	None	1B.2	Chenopod scrub, alkali meadow, playas, valley and foothill grassland.	In seasonal alkali wetlands or alkali sink scrub with *Distichlis spicata*, *Frankenia salina*, and other alkali species. 1-835 m. Flowers April to September.	None. Suitable habitat is not present in open-cut areas.	Possible. Potential habitat for this species occurs in alkaline flats adjacent to the Project Area between Stations 553+00 to 563+00. Species was not observed during 2014 reconnaissance surveys (Horizon 2014b).
Tehama County western flax *Hesperolinon tehamense*	None	None	1B.3	Chaparral, cismontane woodland.	Serpentine barrens in chaparral. 100-1,250 m. Flowers May to June.	None. Suitable habitat is not present. Project Area is not within species known elevation range.	None. Suitable habitat is not present. Project Area is not within species known elevation range.
Mt. Hamilton coreopsis *Leptosyne hamiltonii*	None	None	1B.2	Cismontane woodland.	On steep shale talus with open southwestern exposure. 530-1,300 m. Flowers March to May.	None. Suitable habitat is not present. Project Area is not within species known elevation range.	None. Suitable habitat is not present. Project Area is not within species known elevation range.
Hall's bush-mallow *Madia radiata*	None	None	1B.1	Valley and foothill grassland, cismontane woodland, chenopod scrub.	Grassy or open slopes, generally clayey soils or shale. 25-1,125 m. Flowers March to May.	None. Suitable habitat is not present.	None. Suitable habitat is not present.

Name	Federal listing status	State listing status	Rare Plant Rank	General Habitat	Micro Habitat and Flowering Period	Potential to Occur in Open-cut Construction Areas	Potential to Occur in Trenchless Construction Areas or Adjacent Habitats
showy golden madia *Malacothamnus hallii*	None	None	1B.2	Chaparral.	Some populations on serpentine. 10-550 m. Flowers May to October.	None. Suitable habitat is not present.	None. Suitable habitat is not present.
prostrate vernal pool navarretia *Navarretia prostrata*	None	None	1B.1	Coastal scrub, valley and foothill grassland, vernal pools.	Alkaline floodplains and vernal pools. 15-700 m. Flowers April to July.	None. Suitable habitat is not present in open-cut areas.	Possible. Potential habitat for this species occurs in alkaline flats/pool adjacent to the Project Area between Stations 553+00 to 563+00. Species was not observed during 2014 reconnaissance surveys (Horizon 2014b).
Colusa grass *Neostapfia colusana*	FT	SE	1B.1	Vernal pools.	Usually in large, or deep vernal pool bottoms; adobe soils. 5-125 m. Flowers May to August.	None. Suitable habitat is not present.	None. Suitable habitat is not present.
San Joaquin Valley Orcutt grass *Orcuttia inaequalis*	FT	SE	1B.1	Vernal pools.	10-755m. Flowers April to September.	None. Suitable habitat is not present.	None. Suitable habitat is not present.
hairy Orcutt grass *Orcuttia pilosa*	FE	SE	1B.1	Vernal pools.	25-125 m. Flowers May to September.	None. Suitable habitat is not present.	None. Suitable habitat is not present.
Mt. Diablo phacelia *Phacelia phacelioides*	None	None	1B.2	Chaparral, cismontane woodland.	On rock outcrops and talus slopes; sometimes on serpentine. 500-1,370 m. Flowers April to June.	None. Suitable habitat is not present. Project Area is not within species known elevation range.	None. Suitable habitat is not present. Project Area is not within species known elevation range.
Hartweg's golden sunburst *Pseudobahia bahiifolia*	FE	SE	1B.1	Valley and foothill grassland, cismontane woodland.	Clay soils, often acidic. Predominantly on the northern slopes of knolls, but also along shady creeks or near vernal pools. 15-150 m. Flowers March to May.	None. Suitable habitat is not present.	None. Suitable habitat is not present.
Sanford's arrowhead *Sagittaria sanfordii*	None	None	1B.2	Marshes and swamps.	In standing or slow-moving freshwater ponds, marshes, and ditches. 0-650 m. Flowers May to October.	None. Suitable habitat is not present in open-cut areas.	Possible. Natural drainages and some manmade drainages provide potentially suitable habitat.
prairie wedge grass *Sphenopholis obtusata*	None	None	2B.2	Cismontane woodland, meadows and seeps.	Open moist sites, along rivers and springs, alkaline desert seeps. 360-2,325m. Flowers April to July.	None. Suitable habitat is not present. Project Area is not within species known elevation range.	None. Suitable habitat is not present. Project Area is not within species known elevation range.

Name	Federal listing status	State listing status	Rare Plant Rank	General Habitat	Micro Habitat and Flowering Period	Potential to Occur in Open-cut Construction Areas	Potential to Occur in Trenchless Construction Areas or Adjacent Habitats
Suisun Marsh aster *Symphyotrichum lentum*	None	None	1B.2	Marshes and swamps (brackish and freshwater).	Most often seen along sloughs, ponds and ditches with *Phragmites sp.*, *Scirpus sp.*, *Rubus armeniacus, Typha*, etc. 0-3 m. Flowers May to November.	None. Suitable habitat is not present in open-cut areas.	Not expected. Natural and some manmade drainages provide potentially suitable habitat, but this species does not typically occur in this portion of the SJR valley.
Greene's tuctoria *Tuctoria greenei*	FE	Rare	1B.1	Vernal pools, valley and foothill grassland.	Clay bottoms of drying vernal pools and lakes in valley grassland. 5-10 m. Flowers May to September.	None. Suitable habitat is not present.	None. Suitable habitat is not present.
Red Hills vervain *Verbena californica*	FT	ST	1B.1	Cismontane woodland, valley and foothill grassland.	Mesic sites on serpentine; usually serpentine seeps or creeks. 260-400 m. Flowers May to September.	None. Suitable habitat is not present. Project Area is not within species known elevation range.	None. Suitable habitat is not present. Project Area is not within species known elevation range.

* List of Abbreviations for Federal and State Species Status follow below:
FE = Federal endangered
FP = State fully protected species
FT = Federal threatened
SE = State endangered
SSC = State species of special concern
ST = State threatened
California Native Plant Society, California Rare Plant Rank:
(1A) Presumed extinct in California
(1B) Rare, threatened, or endangered in California and elsewhere
(2) Rare, threatened, or endangered in California but common elsewhere.
1 – Seriously endangered in California.
2 – Fairly endangered in California.
3 – Not very endangered in California

Table 3.4-2: Special-Status Wildlife Species

Scientific name	Federal listing status	State listing status	General Habitat	Micro Habitat	Potential to Occur in Open-cut Construction Areas	Potential to Occur in Trenchless Construction Areas or Adjacent Habitats
Invertebrates						
Conservancy fairy shrimp *Branchinecta conservatio*	FE	SE	Endemic to the grasslands of the northern two-thirds of the Central Valley; found in large, turbid pools.	Inhabit astatic pools located in swales formed by old, braided alluvium; filled by winter/spring rains, last until June.	None. Suitable habitat is not present in the Project Area.	Possible. Marginally suitable habitat for this species occurs in the alkaline pool adjacent to the Project Area at Station 553+00.
longhorn fairy shrimp *Branchinecta longiantenna*	FE	None	Endemic to the eastern margin of the Central Coast mtns in seasonally astatic grassland vernal pools.	Inhabit small, clear-water depressions in sandstone and clear-to-turbid clay/grass-bottomed pools in shallow swales.	None. Suitable habitat is not present in the Project Area.	Possible. Potential habitat for this species occurs in alkaline pools/swales adjacent to the Project Area between Stations 553+00 to 557+00.
vernal pool fairy shrimp *Branchinecta lynchi*	FT	None	Endemic to the grasslands of the Central Valley, Central Coast mtns, and South Coast mtns, in astatic rain-filled pools.	Inhabit small, clear-water sandstone-depression pools and grassed swale, earth slump, or basalt-flow depression pools. Also known in alkaline pools (Helm 1998).	None. Suitable habitat is not present in open-cut areas.	Possible. Potential habitat for this species occurs in alkaline pools/swales adjacent to the Project Area between Stations 553+00 to 557+00.
valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	FT	None	Occurs only in the central valley of California, in association with blue elderberry (*Sambucus mexicana*).	Not specifically defined.	None. Suitable habitat is not present in open-cut areas.	Possible. Blue elderberry (host plant) was observed near the Harding Drain outlet at the San Joaquin River (SJR) and is potentially present in other parts of the action area at SJR crossings and along other drainages.
vernal pool tadpole shrimp *Lepidurus packardi*	FE	None	Inhabits vernal pools and swales in the Sacramento Valley containing clear to highly turbid water.	Pools commonly found in grass bottomed swales of unplowed grasslands. Some pools are mud-bottomed and highly turbid.	None. Suitable habitat is not present in open-cut areas.	Possible. Potential habitat for this species occurs in alkaline pools/swales adjacent to the Project Area between Stations 553+00 to 557+00.
Fish						
green sturgeon *Acipenser medirostris*	FT	SSC	These are the most marine species of sturgeon. Abundance increases northward of Point Conception. Spawns in the Sacramento, Klamath, and Trinity Rivers.	Spawns at temps between 8-14 C. Preferred spawning substrate is large cobble, but can range from clean sand to bedrock. Occasionally reported in the San Joaquin River upstream from Stockton (Jackson, Z. J., and J. P. Van Eenennaam. 2013)	None. Suitable habitat is not present in open-cut areas.	Not expected. There are anecdotal reports of this species in the SJR downstream of the Project Area (Jackson and Van Eenennaam 2013), but no confirmed accounts. NMFS believes this species would not be present in the Project Area (Pers. Comm. Gutierrez, 2014).

Scientific name	Federal listing status	State listing status	General Habitat	Micro Habitat	Potential to Occur in Open-cut Construction Areas	Potential to Occur in Trenchless Construction Areas or Adjacent Habitats
Delta smelt *Hypomesus transpacificus*	FT	SE	Sacramento-San Joaquin Delta. Seasonally in Suisun Bay, Carquinez Strait and San Pablo Bay.	Seldom found at salinities > 10 ppt. Most often at salinities < 2ppt.	None. Project Area is out of range of the species.	None. Project Area is out of range of the species.
San Joaquin roach *Lavinia symmetricus*	None	SSC	Primarily found in small, warm streams but are capable of thriving in larger, colder streams with diverse conditions	Extreme tolerance includes temperatures ranging from 85-95ºF and dissolved oxygen levels as low as 1-2 ppm	None. Suitable habitat is not present in open-cut areas.	Possible. The SJR in the Project Area provides potentially suitable habitat.
steelhead (Central Valley DPS) *Oncorhynchus mykiss*	FT	None	Populations spawning in the Sacramento and San Joaquin rivers and their tributaries. Distribution of steelhead in the Central Valley has been significantly reduced in recent years.	Require beds of loose, silt-free, coarse gravel for spawning. Also need cover, cool water and sufficient dissolved oxygen.	None. Suitable habitat is not present in open-cut areas.	Present. Merced River, upstream of the Project Area, supports a small run of steelhead. Species uses SJR as migratory habitat.
Chinook salmon (Central Valley fall- late fall-run ESU) *Oncorhynchus tshawytscha*	FC	SSC	Populations spawn in the Sacramento and San Joaquin rivers and tributaries.	Require beds of loose, silt-free, coarse gravel for spawning. Also need cover, cool water and high dissolved oxygen.	None. Suitable habitat is not present in open-cut areas.	Present. Merced River, upstream of the Project Area, supports fall-run Chinook. Species uses SJR as migratory habitat.
Chinook salmon (Central Valley spring-run ESU) *Oncorhynchus tshawytscha*	FT	ST	Populations spawning in Sacramento River tributaries.	Require beds of loose, silt-free, coarse gravel for spawning. Also need cover, cool water and sufficient dissolved oxygen.	None. Suitable habitat is not present in open-cut areas.	Not expected. Naturally spawned spring-run Chinook have been extirpated from the SJR drainage (Lindley et al. 2004). Strays from populations in the Sacramento River basin may occasionally occur.
Chinook salmon (Central Valley spring-run ESU) *Oncorhynchus tshawytscha*	Nonessential experimental population	See FGC 2080.2 to 2080.4.	All spring-run Chinook salmon, including those that have been released or propagated, naturally or artificially, within the experimental population area, which is defined as the San Joaquin River from Friant Dam downstream to its confluence with the Merced River (exclusive)].	Require beds of loose, silt-free, coarse gravel for spawning. Also need cover, cool water and sufficient dissolved oxygen.	None. Suitable habitat is not present in open-cut areas.	Present. A nonessential experimental population has recently been reintroduced to this portion of the SJR (SJRRP 2014).

Scientific name	Federal listing status	State listing status	General Habitat	Micro Habitat	Potential to Occur in Open-cut Construction Areas	Potential to Occur in Trenchless Construction Areas or Adjacent Habitats
Chinook salmon (Sacramento River winter-run ESU) *Oncorhynchus tshawytscha*	FE	SE	Populations spawning in the Sacramento and San Joaquin Rivers and their tributaries.	Require beds of loose, silt-free, coarse gravel for spawning. Also need cover, cool water and sufficient dissolved oxygen.	None. Project Area is outside of species range.	None. Project Area is outside of species range.
hardhead *Mylopharodon conocephalus*	None	SSC	Widely distributed in low to mid-elevation streams in the Sacramento and San Joaquin River tributaries	—	None. Suitable habitat is not present in open-cut areas.	Possible. Species has recently been observed in SJR near confluence with Stanislaus (Pers. Comm. Merz, 2014).
Sacramento splittail *Pogonichthys macrolepidotus*	None	SSC	Endemic to the lakes and rivers of the Central Valley, but now confined to the Delta, Suisun Bay and associated marshes.	Slow moving river sections, dead end sloughs. Requires flooded vegetation for spawning and foraging for young.	None. Suitable habitat is not present in open-cut areas.	Present. Species distribution fluctuates. During wet years, species has been observed upstream of the Project Area. During dry years, species is not common downstream of the Tuolumne River confluence (Moyle 2002).
Pacific lamprey *Lampetra tridentate*	FSC	None	Found in Pacific Coast streams north of San Luis Obispo Co., however regular runs in Santa Clara River. Size of runs is declining	Swift-current gravel bottomed areas for spawning with water temps between 12-18 C. Ammocoetes need soft sand or mud.	None. Suitable habitat is not present in open-cut areas.	Possible. Species has been observed in SJR upstream and downstream of the Project Area. Various lifestages maybe present year-round. Spawning habitat is not present.
Kern brook lamprey *Entospherus hubbsi*	None	SSC	San Joaquin River system and Kern River	Gravel-bottomed areas for spawning and muddy-bottomed areas where ammocoetes can burrow and feed.	None. Suitable habitat is not present in open-cut areas.	Possible. Species has been observed in SJR upstream and downstream of the Project Area. Various lifestages maybe present year-round. Spawning habitat is not present.
river lamprey *Lampetra ayresii*	None	SSC	San Joaquin River system and Kern River	Adults need clean, gravelly riffles, ammocoetes need sandy backwaters or stream edges, good water quality and temps < 25 C	None. Suitable habitat is not present in open-cut areas.	Possible. Species has been observed in SJR upstream and downstream of the Project Area. Various lifestages maybe present year-round. Spawning habitat is not present.
Amphibians and Reptiles						
California tiger salamander *Ambystoma californiense*	FT	ST	Central Valley DPS federally listed as threatened. Santa Barbara and Sonoma counties DPS federally listed as endangered.	Need underground refuges, especially ground squirrel burrows and vernal pools or other seasonal water sources for breeding	None. Suitable habitat is not present in the Project Area.	None. The alkaline pool adjacent to the Project Area at Station 553+00 provides potentially suitable breeding habitat, but the Project Area lacks suitable upland habitat.
Yosemite toad Bufo canorus	FC	SSC	Vicinity of wet meadows in central High Sierra, 6,400 to 11,300 feet in elevation	Primarily montane wet meadows; also in seasonal ponds associated with lodgepole pine and subalpine conifer forest.	None. Project Area is outside of species range.	None. Project Area is outside of species range.

Scientific name	Federal listing status	State listing status	General Habitat	Micro Habitat	Potential to Occur in Open-cut Construction Areas	Potential to Occur in Trenchless Construction Areas or Adjacent Habitats
western pond turtle *Actinemys (=Emys) marmorata*	None	SSC	A thoroughly aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches with aquatic vegetation below 6000 ft elevation.	Need basking sites and suitable (sandy banks or grassy open fields) upland habitat up to 0.5 km from water for egg-laying.	None. Suitable habitat is not present in open-cut areas.	Possible. Species is likely to occur in SJR, natural drainages, and some ditches.
Blunt-nosed leopard lizard *Gambelia sila*	FE	SE, FP	Resident of sparsely vegetated alkali and desert scrub habitats, in areas of low topographic relief.	Seeks cover in mammal burrows, under shrubs or structures such as fence posts; they do not excavate their own burrows	None. Project Area is outside of species current range.	None. Project Area is outside of species current range.
San Joaquin whipsnake *Masticophis flagellum ruddocki*	None	SSC	Open, dry habitats with little or no tree cover. Found in valley grassland and saltbush scrub in the San Joaquin Valley	Needs mammal burrows for refuge and oviposition sites.	None. Suitable habitat is not present in open-cut areas.	Possible. Saltbush scrub on the inboard side of SJR levee near Station 1335 is potentially suitable habitat. Species was not observed in this location during surveys conducted for the Harding Drain Bypass Project (Horizon 2014a).
Alameda whipsnake *Masticophis lateralis euryxanthus*	FT	ST	Typically found in chaparral and scrub habitats but will also use adjacent grassland, oak savanna and woodland habitats.	Mostly south-facing slopes and ravines, with rock outcrops, deep crevices or abundant rodent burrows, where shrubs form a vegetative mosaic with oak trees and grasses.	None. Project Area is outside of species range.	None. Project Area is outside of species range.
foothill yellow-legged frog *Rana boylii*	None	SSC	Shallow, flowing water in small to moderate-sized streams with at least some cobble-sized substrate	___	None. Suitable habitat is not present in the Project Area.	None. Suitable habitat is not present in the Project Area.
California red-legged frog *Rana draytonii*	FT	SSC	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation.	Requires 11-20 weeks of permanent water for larval development. must have access to estivation habitat.	None. Species has been extirpated from Central Valley floor (USFWS 2002).	None. Species has been extirpated from Central Valley floor (USFWS 2002).
western spadefoot *Spea hammondii*	None	SSC	Occurs primarily in grassland habitats, but can be found in valley-foothill hardwood woodlands.	Vernal pools are essential for breeding and egg-laying.	None. Suitable habitat is not present in Project Area.	None. Suitable habitat is not present in Project Area.

Scientific name	Federal listing status	State listing status	General Habitat	Micro Habitat	Potential to Occur in Open-cut Construction Areas	Potential to Occur in Trenchless Construction Areas or Adjacent Habitats
giant garter snake *Thamnophis gigas*	FT	ST	Prefers freshwater marsh and low gradient streams. Has adapted to drainage canals and irrigation ditches.	This is the most aquatic of the garter snakes in California.	None. Suitable habitat is not present in open-cut areas.	Possible. Natural drainage on east side of SJR and freshwater wetlands within SJR provide marginal to potentially suitable habitat. Harding Drain and other large ditches with emergent vegetation provide marginal habitat. Species was not observed during surveys conducted for the Harding Drain Bypass Project (Horizon 2014a). Closest known occurrences is approximately 13 miles south of the Study Area in Merced County near Gustine, CA.
Birds						
tricolored blackbird *Agelaius tricolor*	None	Emergency Protection Status as of 12/3/14 per FGC 2076.5, SSC	Highly colonial species, most numerous in Central Valley and vicinity. Largely endemic to California.	Requires open water, protected nesting substrate, and foraging area with insect prey within a few km of the colony.	Possible. Agricultural fields planted with silage or grain provide potential breeding habitat.	Present. In 2014, breeding was documented in natural channel in Modesto WTP spray fields (UC Davis 2014)
burrowing owl *Athene cunicularia*	None	SSC	Open, dry annual or perennial grasslands, deserts and scrublands characterized by low-growing vegetation.	Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.	Possible. Suitable habitat is present within the Project Area. Evidence of species was not observed during reconnaissance surveys (Horizon 2014b). Most recent sighting in the vicinity of the Project Area is from 2003 (CDFW 2014, ebird.org 2014)	Possible. Suitable habitat is present within the Project Area. Evidence of species was not observed during reconnaissance surveys (Horizon 2014b). Most recent sighting in the vicinity of the Project Area is from 2003 (CDFW 2014, ebird.org 2014)
golden eagle *Aquila chrysaetos*	None	FP	Tundra, through grasslands, forested habitat and woodland-brushlands, south to arid deserts.	—	Possible. Species is commonly observed in canyons/foothills to the west of the Project Area (ebird.org 2014). Flyover possible; no suitable nesting habitat.	Possible. Species is commonly observed in canyons/foothills to the west of the Project Area (ebird.org 2014). Flyover possible; marginal foraging and nesting habitat.
cackling goose *Branta hutchinsii leucopareia*	FD	None	Winters on lakes and inland prairies.	Forages on natural pasture or that cultivated to grain; loafs on lakes, reservoirs, ponds.	Present. Species may forage in agricultural fields throughout the Project Area.	Present. Species is seasonally abundant in Modesto WTP ponds (ebird.org 2014).
Swainson's hawk *Buteo swainsoni*	None	ST	Breeds in grasslands with with scattered trees, juniper-sage flats, riparian areas, savannahs, and agricultural or ranch lands with groves or lines of trees.	Requires adjacent suitable foraging areas such as grasslands, or alfalfa or grain fields supporting rodent populations.	Present. Species may forage in agricultural fields throughout the Project Area.	Present. Nesting habitat is present in SJR corridor and the natural drainage to the west of the river.

Scientific name	Federal listing status	State listing status	General Habitat	Micro Habitat	Potential to Occur in Open-cut Construction Areas	Potential to Occur in Trenchless Construction Areas or Adjacent Habitats
northern harrier *Circus cyaneus*	None	SSC	Rolling foothills and valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodland.	Open grasslands, meadows, or marshes for foraging close to isolated, dense-topped trees for nesting and perching.	Present. Species has been observed in Modesto WTP spray fields (ebird.org 2014). Flood irrigated pastures provide potential nesting habitat.	Present. Species has been observed in Modesto WTP spray fields (ebird.org 2014). Flood irrigated pastures provide potential nesting habitat.
Western yellow-billed cuckoo *Coccyzus americanus occidentalis*	FT	SE	Riparian forest nester, along the broad, lower flood-bottoms of larger river systems.	Nests in riparian jungles of willow, often mixed with cottonwoods, w/ lower story of blackberry, nettles, or wild grape.	None. Project Area is outside of species range.	None. Project Area is outside of species' current breeding territory. Riparian tree/shrub cover is patchy (not dense) and limited in size. It is not typical of the preferred breeding habitat for this species.
yellow warbler *Dendroica petechia*	None	SSC	Riparian plant associations. Prefers willows, cottonwoods, aspens, sycamores, and alders for nesting and foraging.	Also nests in montane shrubbery in open conifer forests.	Possible. Species may forage in agricultural fields adjacent to the SJR.	Possible. Species may nest in SJR riparian areas.
white-tailed kite *Elanus leucurus*	None	FP	Rolling foothills and valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodland.	Open grasslands, meadows, or marshes for foraging close to isolated, dense-topped trees for nesting and perching.	Present. Species has been observed in Modesto WTP spray fields (ebird.org 2014). Foraging possible; no suitable nesting habitat.	Present. Species has been observed in Modesto WTP spray fields (ebird.org 2014). Riparian areas in SJR and isolated mature trees in agricultural areas provide potential nesting habitat.
bald eagle *Haliaeetus luecocephalus*	FD	SE, FP	Permanent resident, and uncommon winter migrant, now restricted to breeding mostly in Butte, Lake, Lassen, Modoc, Plumas, Shasta, Siskiyou, and Trinity Counties.	Requires large bodies of water, or free flowing rivers with abundant fish, and adjacent snags or other perches.	Possible. Species has been observed in canyons/foothills to the west of the Project Area and at Modesto WTP (ebird.org 2014). Flyover and foraging possible; no suitable nesting habitat.	Possible. Species has been observed in canyons/foothills to the west of the Project Area and at Modesto WTP (ebird.org 2014). SJR provides suitable foraging and roosting habitat; nesting unlikely.
loggerhead shrike *Lanius ludovicianus*	None	SSC	Broken woodlands, savannah, pinyon-juniper, joshua tree, and riparian woodlands, desert	Prefers open country for hunting, with perches for scanning, and fairly dense shrubs and	Present. Species may forage in agricultural fields throughout the Project Area.	Present. Species may nest in SJR riparian areas.
song sparrow (Modesto population) *Melospiza melodia*	None	SSC	Emergent freshwater marshes, riparian willow thickets. riparian forests, vegetated irrigation canals and levees	Inhabits cattails, tules and other sedges; also known to frequent tangles bordering sloughs.	None. Project Area is outside of species range.	None. Project Area is outside of species range.
California least tern *Sternula antillarum browni*	FE	SE, FP	Shallow estuaries and lagoons.	Nests on beaches or tidal flats.	None. Project Area is outside of species range.	None. Project Area is outside of species range.

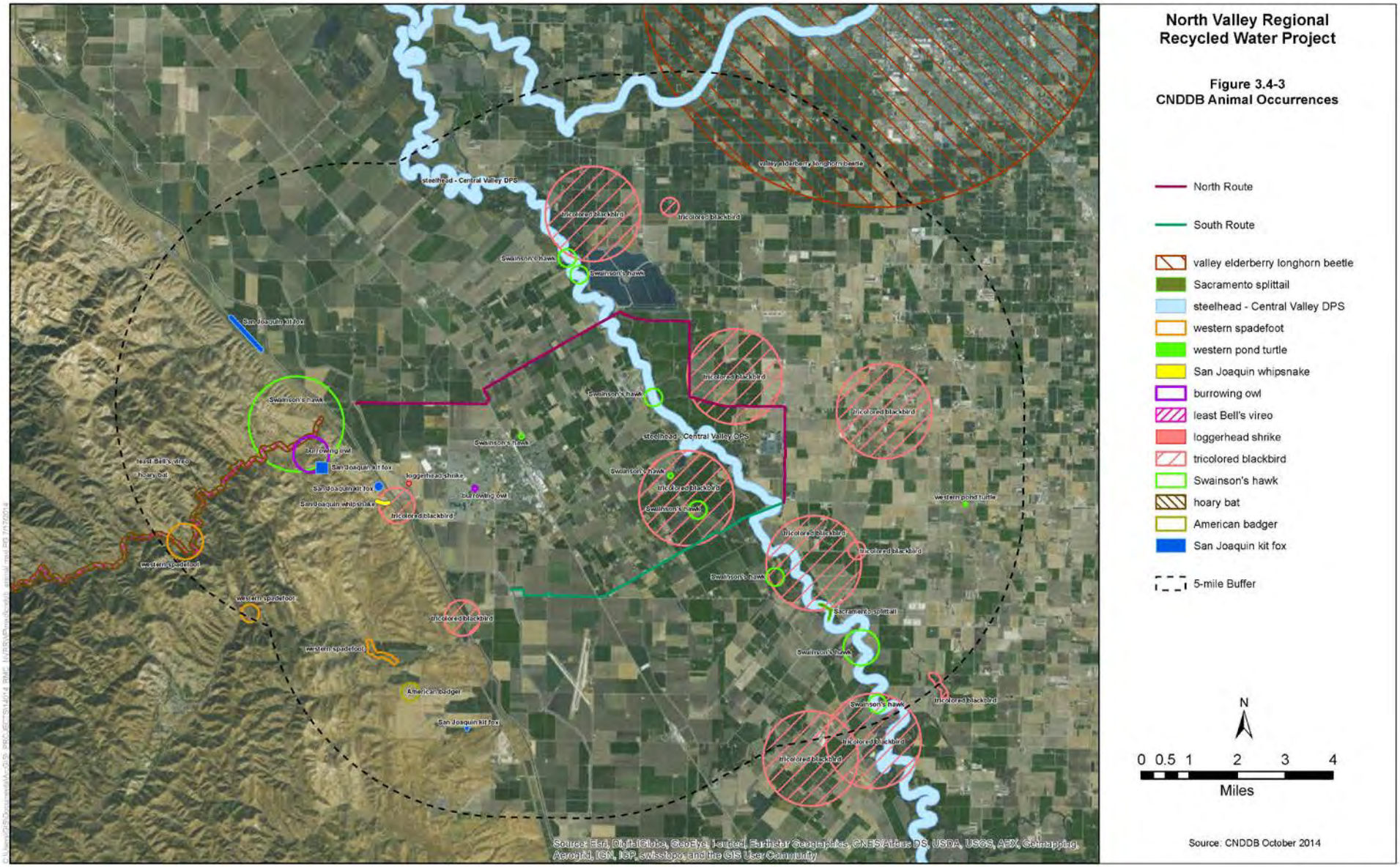
Scientific name	Federal listing status	State listing status	General Habitat	Micro Habitat	Potential to Occur in Open-cut Construction Areas	Potential to Occur in Trenchless Construction Areas or Adjacent Habitats
least Bell's vireo *Vireo bellii pusillus*	FE	SE	Summer resident of southern California in low riparian in vicinity of water or in dry river bottoms; below 2000 ft.	Not specifically defined.	None. Suitable habitat is not present in open-cut areas.	Not expected. Species has recently been observed in restored riparian habitat at the SJR National Wildlife Refuge approximately 10 miles north of the Project Area (Howell et al. 2010). Some riparian areas in the Project Area provide marginal breeding habitat. Due to the species rarity in the Central Valley and habitat quality, it is not expected to breed in the Project Area.
Mammals						
western red bat *Lasiurus blossevillii*	None	SSC	Roosts primarily in trees, 2-40 ft above ground, from sea level up through mixed conifer forests.	Prefers habitat edges and mosaics with trees that are protected from above and open below with open areas for foraging.	None. Suitable habitat is not present in open-cut areas.	Possible. Roosting habitat is present in SJR corridor.
pallid bat *Antrozous pallidus*	None	SSC	Grasslands, shrublands, woodlands, and forests from sea level up through mixed conifer forests	Prefers rocky outcrops, cliffs, and crevices with access to open habitats for foraging. Day roosts are in caves, crevices, mines, and occasionally in hollow trees and buildings.	None. Suitable habitat is not present in open-cut areas.	Not expected. Minimal habitat is present.
Fresno kangaroo rat *Dipodomys nitratoides exilis*	FE	SE	Alkali sink-open grassland habitats in western Fresno County.	Bare alkaline clay-based soils subject to seasonal inundation, with more friable soil mounds around shrubs and grasses.	None. Project Area is outside of species range.	None. Project Area is outside of species range.
Riparian woodrat *Neotoma fuscipes riparia*	FE	SSC	Riparian areas along the San Joaquin, Stanislaus and Tuolumne rivers.	Need areas with mix of brush and trees. Need suitable nesting sites in trees, snags or logs.	None. Suitable habitat is not present in open-cut areas.	Not expected. Known populations are limited to San Joaquin River National Wildlife Refuge and Caswell Memorial State Park (USFWS 2012d), which are approximately 9 and 12 miles north of the action area, respectively. Habitat in the action area is considered marginally suitable for riparian woodrats due to lack of mature overstory. No woodrat houses were observed during field reconnaissance surveys (Horizon 2014b).

Scientific name	Federal listing status	State listing status	General Habitat	Micro Habitat	Potential to Occur in Open-cut Construction Areas	Potential to Occur in Trenchless Construction Areas or Adjacent Habitats
Riparian brush rabbit *Sylvilagus bachmani riparius*	FE	SE	Riparian areas on the San Joaquin River in northern Stanislaus county.	Dense thickets of wild rose, willows, and blackberries.	None. Suitable habitat is not present in open-cut areas.	Not expected. Existing populations are limited to Caswell Memorial State Park and a region in the south Delta near Lathrop (Kelly et al. 2011). Riparian habitat in the action area supports willow thickets, but generally lacks other vegetation species (e.g., wild rose, blackberry) commonly found in habitat occupied by riparian brush rabbits. Suitable habitat in the action area is not well connected to occupied habitat at Caswell Memorial State Park, thus potential for dispersal to the action area is uncertain.
American badger *Taxidea taxus*	None	SSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils.	Needs sufficient food, friable soils and open, uncultivated ground. Preys on burrowing rodents. Digs burrows.	Not expected. Minimal habitat is present in open-cut areas.	Possible. Drier portions of the SJR floodplain provide foraging and dispersal habitat. Denning is not expected.
San Joaquin kit fox *Vulpes macrotis mutica*	FE	ST	Annual grasslands or grassy open stages with scattered shrubby vegetation.	Need loose-textured sandy soils for burrowing, and suitable prey base.	Not expected. Minimal habitat is present in the Study Area. Lands to the west of the Study Area provide linkages for populations to the south and north (USFWS 2009). Kit fox presence in the northern range may be dependent on occasional dispersing animals from populations to the south of Santa Nella (Constable et al. 2009). The closest occurrence is approximately 3 miles west of the Study Area along Interstate 5.	Not expected. Minimal habitat is present in the Study Area. Lands to the west of the Study Area provide linkages for populations to the south and north (USFWS 2009). Kit fox presence in the northern range may be dependent on occasional dispersing animals from populations to the south of Santa Nella (Constable et al. 2009). The closest occurrence is approximately 3 miles west of the Study Area along Interstate 5.

* List of Abbreviations for Federal and State Species Status follow below:
FC = Federal candidate for listing
FD = Federal delisted
FE = Federal endangered
FP = State fully protected species
FSC = federal species of concern
FT = Federal threatened
SE = State endangered
ST = State threatened
SSC = State species of special concern

Figure 3.4-2: CNDDB Plant Occurrences

Figure 3.4-3: CNDDB Animal Occurrences



According to the CNDDB (CDFW 2014), the record for vernal pool smallscale along Carpenter Road is from 1965 and the location was mapped as a "best guess" by CNDDB and this occurrence is considered "possibly extirpated". The only potentially suitable habitat for this species in the Study Area is in the alkaline pool/swale adjacent to the Stations 553+00 to 563+00 (**Figure 3.4-1**, Sheet 9). This species was not observed during 2014 reconnaissance surveys (Horizon 2014b). The occurrence of Delta button celery is from 1968 and is also considered possibly extirpated. Potentially suitable habitat for this species in the Study Area occurs along the San Joaquin River.

Twenty-five of the thirty-nine special-status plant species known to occur in the vicinity of the Study Area are considered to have no potential to occur in the Study Area (**Table 3.4-1**). These species are associated with habitats that are not present in the Study Area, or the Study Area is not within the current range of the species. An additional three special-status plant species are not expected to occur in the Study Area because only marginally suitable habitat is present and/or these species have not been recently observed in the vicinity of the Study Area. Eleven special-status plant species are considered to have the potential to occur in trenchless construction areas or adjacent habitats. No special-status plants are considered to have the potential to occur in areas proposed for open-cut construction (**Table 3.4-1**).

Most of the special-status plants with the potential to occur in trenchless construction areas or adjacent habitats are associated with alkali flat or alkali scrub habitats. These species include: Alkali milk-vetch (*Astragalus tener var. tener)*, heartscale (*Atriplex cordulata*), brittlescale (*Atriplex depressa*), lesser saltscale (*Atriplex minuscula*), vernal pool smallscale (*Atriplex persistens*), Hispid bird's beak (*Chloropyron molle* ssp. *hispidum*), San Joaquin spearscale (*Extriplex joaquiniana*), and prostrate vernal pool navarretia (*Navarretia prostrata*). Several *Atriplex* species were observed within the alkali scrub/alkali flat. One was immature, making identification to the species level impossible at that time. No special-status *Atriplex* species were confirmed.

Special-status plant species associated with riparian habitat or freshwater wetlands with the potential to occur in the Study Area include slough thistle (*Cirsium crassicaule*), Delta button celery (*Eryngium racemosum*), and Sanford's arrowhead (*Sagittaria sanfordii*). Potential habitat for slough thistle occurs in San Joaquin River crossings, natural drainages, and alkali scrub. Potential habitat for Delta button celery is present within the San Joaquin River crossings, however, the microhabitat conditions favored by this species were not observed during the 2014 reconnaissance surveys (Horizon 2014b). Freshwater wetlands within the San Joaquin River crossings, natural drainages, and some drainage ditches provide potentially suitable habitat for Sanford's arrowhead.

Combined Alignment Alternative

Potential adverse impacts to special-status plants would be minimized by using trenchless construction techniques and avoiding open-cut construction in sensitive habitats. However, potential impacts to special-status plants may result from erosion, sedimentation or alteration in drain patterns within suitable habitat. These impacts would be considered potentially significant.

Several mitigation measures are proposed to avoid, reduce, or compensate for potential impacts. **Mitigation Measure BIO-1a** would minimize the area of potential disturbance to habitat for special-status plants. Where disturbance within special-status plant habitat cannot be avoided, **Mitigation Measure BIO-1b** would identify the extent to which special-status plants are present and could be adversely affected by the project. For special-status plants found to be present, **Mitigation Measure BIO-1c** would require monitoring to confirm avoidance of identified special-status plant populations, and compensatory mitigation should special-status plants be adversely affected. Finally, **Mitigation Measure BIO-1d** would be implemented to reduce impacts in the event of a frac-out, and a Draft Sample Frac-out Prevention Plan for Horizontal Directional Drilling is included in **Appendix F**. With implementation of these mitigation measures, impacts would be less than significant.

Separate Alignment Alternative

The Separate Pipeline Alternative would have similar impacts to the Combined Alignment Alternative, although there would be no potential impacts to special-status plants that may occur in alkali habitats between Stations 553+00 to 563+00 (**Figure 3.4-1**, Sheet 9) because the route for this alternative does not cross that area. This alternative would have a greater potential to impact special-status plants that may be associated with habitats in the San Joaquin River, such as slough thistle and Delta button celery. There is also a small patch of saltbush scrub on the inboard side of San Joaquin River levee near Station 1335 (**Figure 3.4-1**, Sheet 11) that could potentially support special-status plants.

Potential impacts to special-status plants would be minimized by using trenchless construction techniques and avoiding open-cut construction in sensitive habitats. However, potential impacts to special-status plants may result from erosion, sedimentation or alteration in drain patterns within suitable habitat. These impacts would be considered potentially significant.

Mitigation Measure BIO-1a, Mitigation Measure BIO-1b, Mitigation Measure BIO-1c, and Mitigation Measure BIO-1d would be implemented as described for the Separate Alignment Alternative. With implementation of these mitigation measures, impacts would be less than significant.

PID Conveyance Alternative

The PID Conveyance Alternative would have similar impacts to the Combined Alignment Alternative, except there would be no potential impacts to special-status plants that may occur in alkali habitats adjacent to West Main Street because the route for this alternative does not cross that area. Unlike Alternatives 1 and 2, this alternative would require construction directly in the bank of the San Joaquin River to expand the existing PID intake. Although the river provides habitat for special status plants such as slough thistle and Delta button celery, these species were not identified as present at the intake site (PID 2006).

However, Alternative 3 still has the potential to affect special-status plants either directly or from erosion, sedimentation or alteration in drain patterns within suitable habitat. These impacts would be considered potentially significant.

Mitigation Measure BIO-1a, Mitigation Measure BIO-1b, and Mitigation Measure BIO-1c would be implemented as described for Alternatives 1 and 2. With implementation of these mitigation measures, impacts would be less than significant.

No Action Alternative

Under the No Action Alternative, no new pipeline or pump station construction and operation would occur. Therefore, no impacts to special-status plants would occur.

Significance Determination before Mitigation

Potentially significant for all action alternatives.

Mitigation Measures

See **Mitigation Measure HYD-1b**, which requires implementation of BMPs to control erosion and sediment during construction, avoiding indirect impacts to plants for erosion or sedimentation during construction.

Mitigation Measure BIO-1a: Avoid or Minimize Impacts to Special-Status Plant Species (Alternatives 1, 2 and 3)

To the extent feasible, project-related activities shall avoid habitats with the potential to support special-status plants, including alkali flats, alkali scrub, alkali pools, and freshwater wetlands. To the extent feasible, the proposed project shall minimize potential impacts to special-status plants by

utilizing trenchless construction techniques within habitats with the potential to support special-status plants.

Mitigation Measure BIO-1b: Perform Focused Surveys for Special-Status Plant Species in Suitable Habitats (Alternatives 1, 2 and 3)

Within one year prior to commencement of construction activities, a qualified botanist shall perform surveys for special-status plant species within potentially suitable habitat in the vicinity of open-cut construction areas (Survey areas for the Combined and Separate Alignment Alternatives are shown in **Table 3.4-3 and Figure 3.4-1**; for the PID Conveyance Alternative surveys shall take place at the intake site). Floristic surveys shall be performed according to the *Protocols for Surveying and Evaluating Impacts to Specials Status Native Plant Populations and Natural Communities* (CDFG 2009 or current version). Floristic surveys shall include the use of a reference population, as reasonably feasible, to increase the likelihood of detection, and shall be performed during the appropriate bloom period(s) for each species. If special-status plants are detected within a 100-foot radius or within the microwatershed of an open-cut construction area (including pits that would be used for trenchless construction), **Mitigation Measure BIO-1c** shall be implemented.

Mitigation Measure BIO-1c: Monitor or Compensate for Impacts to Special-Status Plant Species (Alternatives 1, 2 and 3)

The locations of special-status plants within the microwatershed or within 100 feet of construction areas shall be marked and the size of the population shall be recorded. Locations of special-status plant populations shall be clearly identified in the field by staking, flagging, or fencing. The plants shall be monitored throughout the duration of construction to determine if the project has resulted in adverse effects (direct or indirect), as determined by a qualified botanist.

If the botanist determines that special-status plants may have been adversely effected, then the Partner Agencies shall implement measures to compensate for the impact. Compensation measures may include transplanting perennial species, seed collection and dispersal for annual species, and other conservation strategies that shall restore and protect the viability of the local population. If minimization measures are implemented, monitoring of plant populations shall be conducted annually for 5 years to assess the mitigation's effectiveness. The performance standard for the mitigation shall be no net reduction in the size or viability of the local population.

Table 3.4-3: Survey Area for Special-Status Species and Sensitive Biological Resources

Mitigation Measure	Species	Location (Station Number)	Timing of Surveys
BIO-1b: Special-Status Plant Species	Alkali milkvetch (*Astragalus tener var. tener*) heartscale (*Atriplex cordulata*) brittlescale (*Atriplex depressa*) lesser saltscale (*Atriplex minuscula*) vernal pool smallscale (*Atriplex persistens*) Hispid bird's beak (*Chloropyron molle* ssp. *hispidum*) slough thistle (*Cirsium crassicaule*) San Joaquin spearscale (*Extriplex joaquiniana*) prostrate vernal pool navarretia (*Navarretia prostrata*)	553+00 to 563+00	Within 1 year prior to construction and during appropriate bloom periods

Mitigation Measure	Species	Location (Station Number)	Timing of Surveys
	slough thistle (*Cirsium crassicaule*) Sanford's *arrowhead* (*Sagittaria sanfordii*)	335+00 to 345+00 373+00 to 376+00 436+00 to 438+00 563+00 to 564+00 Harding Drain 1265+00 to 1270+00	
BIO-3b: Minimize or Compensate for Impacts to Valley Elderberry Longhorn Beetle	Elderberry plants/Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus)*	Within 200 feet of all open-cut construction areas	No greater than two years and no less than 120 days prior to construction.
Bio-6: Avoid and Minimize Impacts to Giant Garter Snake	Giant garter snake (*Thamnophis gigas*)	Within 200 feet of: 335+00 to 345+00 373+00 to 376+00 436+00 to 438+00 563+00 to 564+00 Harding Drain	24 hours prior to construction and monitoring during construction within 200 feet of potential aquatic habitat.
Bio-8: Avoid and Minimize Impacts to Western Pond Turtle	Western pond turtle (*Actinemys marmorata*)	335+00 to 345+00 373+00 to 376+00 436+00 to 438+00 563+00 to 564+00 Harding Drain 1265+00 to 1270+00	14 days and 24 hours (survey twice)
Impact Bio-9: Avoid, Minimize, or Compensate for Impacts to Burrowing Owl	Burrowing owl (*Athene cunicularia*)	Open-cut construction areas	At least 24 hours but no more than 30 days
Impact Bio-10: Avoid and Minimize Impacts to Tricolored Blackbird Nesting Colonies	Tricolored blackbird (*Agelaius tricolor*)	Agricultural fields planted with silage or grain 320+00 to 345+00 373+00 to 376+00 436+00 to 438+00 563+00 to 564+00 Harding Drain 1265+00 to 1270+00	Within 15 days of construction for activities occurring between Feb.1 – Aug. 31
BIO-12: Avoid, Minimize, or Compensate for Impacts to Raptors including Special-status species	Swainson's hawk (*Buteo swainsoni*)	0.5-mile radius from: San Joaquin River Turlock-Modesto Link Segment 1260+00 to 1275+00	See: *Recommended Timing and Methodology for Swainson's Hawk Nesting Survey's in California's Central Valley*
	White-tailed kite (*Elanus leucurus*)		
	Northern harrier (*Circus cyaneus*)	1,000-foot radius from all construction areas	
	Non-listed raptors	0.5-mile radius from all construction areas	
BIO-13: Avoid and Minimize Impacts to Special-status passerine species	Special-status passerines including least Bell's vireo (*Vireo bellii pusillus*)	Protocol surveys for least Bell's vireo in San Joaquin River crossing (s), and 500-foot radius from all	For least Bell's vireo. see: Least Bell's Vireo Survey Guidelines (USFWS 2011a).

Mitigation Measure	Species	Location (Station Number)	Timing of Surveys
and other Birds Protected under the MBTA	Non-listed, MBTA protected passerines	construction areas.	At least 24 hours before construction for activities occurring between Feb.1 – Sept. 15 for other passerines
BIO-14: Avoid and Minimize Impacts to San Joaquin kit fox	San Joaquin kit fox (*Vulpes macrotis mutica*)	Within 200 feet of all construction areas	No less than 14 days and no more than 30 days prior to construction

Mitigation Measure BIO-1d: Develop and Implement a Frac-out Contingency Plan for Trenchless Construction (Alternatives 1 and 2 only)

Prior to constructing a crossing(s) of the San Joaquin River, a Frac-out Prevention and Contingency Plan shall be developed. At minimum, the plan shall prescribe the measures to ensure protection of aquatic resources, special-status plants and wildlife, including:

- Procedures to minimize the potential for a frac-out associated with horizontal directional drilling;
- Procedures for timely detection of frac-outs;
- Procedures for timely response and remediation in the event a frac-out; and
- Monitoring of drilling and frac-out response activities by a qualified biologist.

A Draft Sample Frac-out Prevention Plan for Horizontal Directional Drilling is provided in **Appendix F**.

Significance after Mitigation

Less than significant.

Impact BIO-2: Effects on vernal pool branchiopods.

Vernal pool branchiopods with the potential to occur in the Study Area include Conservancy fairy shrimp (*Branchinecta conservatio*), longhorn fairy shrimp (*Branchinecta longiantenna*), vernal pool fairy shrimp (*Branchinecta lynchi*), and vernal pool tadpole shrimp (*Lepidurus packardi*). Potentially suitable habitat for vernal pool branchiopods in the Study Area is limited to the alkali pool and swale on the south side of West Main Avenue adjacent to the Project Area (**Figure 3.4-1**, Sheet 9, Station 553+00 to 557+00). While vernal pool branchiopods most commonly occur in vernal pools, they may also inhabit other types of seasonal wetlands such as alkali pools and swales (Helm 1998).

Combined Alignment Alternative

The alkali pool and swale with the potential to support vernal pool branchiopods is located on the south side of West Main Avenue. The proposed route for the Combined Alignment Alternative is on the north side of West Main Avenue (**Figure 3.4-1**, Sheet 9). This would likely avoid potential direct and indirect impacts to vernal pool branchiopods and their habitat because: (1) construction would not occur in the microwatershed of the pool or swale; (2) West Main Avenue functions as a hydraulic barrier for surface flow between the north and south sides of the road; and (3) construction is not likely to affect groundwater conditions on the south side of the road.

However, the precise pipeline alignment and construction methods are not known at this time. If construction occurs in the microwatershed of the alkali pool and swale, this could result in sedimentation,

and alteration of hydrology and drainage patterns. These impacts are therefore considered potentially significant.

Several mitigation measures are proposed to avoid, minimize, or compensate for potential impacts. **Mitigation Measure BIO-2a** would avoid impacts to suitable habitat for these species to the extent feasible. Where disturbance of habitat is unavoidable, **Mitigation Measure BIO-2b** would require that impacts be minimized through stormwater controls and site restoration, and compensatory mitigation be provided for impacts to the species or suitable habitat. With implementation of these mitigation measures, impacts would be less than significant.

Separate Alignment Alternative

The Separate Pipeline Alternative is not located in proximity to suitable habitat for vernal pool branchiopods species. Therefore, there would be no impacts to these species.

PID Conveyance Alternative

The PID Conveyance Alternative is not located in proximity to suitable habitat for vernal pool branchiopods species. Vernal pools are not expected to occur at the PID intake site, along the Main Canal ROW, or along Bartch or Ward Avenues. Therefore, there would be no impacts to these species.

No Action Alternative

Under the No Action Alternative, no new pipeline or pump station construction and operation would occur. Therefore, no impacts to vernal pool branchiopods would occur.

Significance Determination before Mitigation

No impact for the Separate Alignment Alternative or PID Conveyance Alternative. Potentially significant for the Combined Alignment Alternative.

Mitigation Measures

Mitigation Measure BIO-2a: Avoid Impacts to Vernal Pool Branchiopods and Their Habitat (Alternative 1)

To the extent feasible, the project-related activities shall avoid impacts to habitat with the potential to support Conservancy fairy shrimp, longhorn fairy shrimp, vernal pool fairy shrimp, and vernal pool tadpole shrimp, including alkali pools and swales. Avoidance shall be defined as no direct or indirect effects to suitable habitat. This shall be accomplished by avoiding construction within the microwatershed of suitable habitat for vernal pool branchiopods.

Mitigation Measure BIO-2b: Minimize and Compensate for Impacts to Branchiopods and Their Habitat (Alternative 1)

If direct or indirect impacts to habitat with the potential to support vernal pool branchiopods cannot be avoided then the following measures shall be implemented:

- Implement a storm water pollution prevention plan (SWPPP) to reduce the potential for sediments and contaminants to enter pools or depressions where vernal pool branchiopods may occur;
- After construction, restore surface topography and drainage to pre-construction conditions; and
- Provide off-site compensation for permanent, temporary, and indirect impacts at ratios determined through consultation with USFWS. The performance standard shall be no net loss in acreage or habitat quality for vernal pool branchiopods, as determined through consultation with USFWS.

Significance after Mitigation

Less than significant.

Impact BIO-3: Effects on valley elderberry longhorn beetle.

Valley elderberry longhorn beetles (VELB) (*Desmocerus californicus dimorphus*) are associated with its host plant elderberry (*Sambucus* spp.). An elderberry shrub was observed near the outlet of the Harding Drain at the San Joaquin River during a reconnaissance survey in 2014 (Horizon 2014b). Elderberry shrubs and VELB have the potential to occur in riparian habitat within the San Joaquin River crossings.

Combined Alignment Alternative

Potential adverse impacts to VELB would be minimized by using trenchless construction techniques in areas where elderberry shrubs are most likely to occur. However, the precise pipeline alignment, construction methods, and locations of all elderberry shrubs are not known at this time. Impacts to VELB and individual elderberry shrubs may result from removal or damage of elderberry plants, fragmentation of habitat, sedimentation, erosion, or alteration in drainage patterns. These impacts are considered potentially significant.

Several mitigation measures are proposed to avoid, minimize, or compensate for potential impacts. **Mitigation Measure BIO-3a** would avoid impacts to the host plant for this species to the extent feasible. If disturbance of the host plant is unavoidable, **Mitigation Measure BIO-3b** would require that impacts be minimized through site restoration and compensatory mitigation for this species. Finally, **Mitigation Measure BIO-1d** would be implemented to reduce impacts in the event of a frac-out. With implementation of these mitigation measures, impacts would be less than significant.

Separate Alignment Alternative

Potential impacts to VELB would be similar to the combined alignment alternative, but there would be a greater chance for impacts in riparian areas because there would be two crossings of the San Joaquin River. These impacts are considered potentially significant.

Mitigation Measure BIO-3a, Mitigation Measure BIO-3b, and Mitigation Measure BIO-1d would be implemented as described for the Separate Alignment Alternative. With implementation of these mitigation measures, impacts would be less than significant.

PID Conveyance Alternative

Surveys of the intake site at the San Joaquin River showed that there were no elderberry shrubs in the vicinity of the intake (PID 2006). However, the alignment of the pipeline along the Main Canal has not been surveyed, and it is possible that elderberry bushes have grown at the intake site since surveys were conducted in 2006. The PID Conveyance Alternative would have similar impacts to the Combined Alignment and Separate Alignment Alternatives.

Mitigation Measure BIO-3a and Mitigation Measure BIO-3b would be implemented as described for Alternatives 1 and 2. With implementation of these mitigation measures, impacts would be less than significant.

No Action Alternative

Under the No Action Alternative, no new pipeline or pump station construction and operation would occur. Therefore, no impacts to VELB would occur.

Significance Determination before Mitigation

Potentially significant for all action alternatives.

Mitigation Measures

See **Mitigation Measure BIO-1d (Alternatives 1 and 2).**

Mitigation Measure BIO-3a: Avoid Impacts to Valley Elderberry Longhorn Beetle (Alternatives 1, 2 and 3)

To the extent feasible, the project shall adhere to avoidance measures outlined in USFWS' *Conservation Guidelines for Valley Elderberry Longhorn Beetle* (USFWS 1999). This shall include the following avoidance measures:

- No less than 120 days prior to commencing construction, the locations of elderberry plants within 200 feet of open-cut construction areas shall be identified;
- Fence and flag all areas to be avoided during construction activities including all established elderberry shrubs within 200 feet of open-cut construction that will not be impacted by construction activities;
- No open-cut construction within 100 feet of the dripline of elderberry plants containing stems measuring 1.0 inch or greater in diameter at ground level;
- Construction personnel shall participate in a Contractor Environmental Awareness Training (CEAT). The CEAT shall communicate the need to avoid damaging the elderberry plants and the possible penalties for not complying with these requirements. The CEAT will instruct work crews about the status of the beetle and the need to protect its elderberry host plant;
- Erect signs every 50 feet along the edge of the avoidance area with the following information: "This area is habitat of the valley elderberry longhorn beetle, a threatened species, and must not be disturbed. This species is protected by the Endangered Species Act of 1973, as amended. Violators are subject to prosecution, fines, and imprisonment." The signs will be maintained for the duration of construction; and
- No insecticides, herbicides, fertilizers, or other chemicals that might harm the beetle or its host plant would be used within 100 feet of any elderberry plant.

Mitigation Measure BIO-3b: Minimize or Compensate for Impacts to Valley Elderberry Longhorn Beetle (Alternatives 1, 2 and 3)

If elderberry plants occur within 100 feet of open-cut construction, their locations shall be reported to the USFWS. In areas where encroachment on the 100-foot buffer has been approved by USFWS, a minimum setback of at least 20 feet from the dripline of each elderberry plant shall be provided, as feasible. For any encroachment into the 100-foot buffer or removal of elderberry plants, the Partner Agencies shall implement measures to compensate for impacts to VELB. Compensation measures shall be consistent with USFWS' *Conservation Guidelines for Valley Elderberry Longhorn Beetle* (USFWS 1999). This shall include establishment of a project-specific VELB Conservation Area or purchase of credits at a USFWS-approved mitigation bank. If the Partner Agencies establish a project-specific Conservation Area, the population of VELBs, the general condition of the Conservation Area, and the condition of the elderberry and associated native plantings in the Conservation Area shall be monitored over a period of ten (10) years. Monitoring and reporting shall be conducted in accordance with the Conservation Guidelines for VELB (USFWS 1999). A minimum survival rate of at least 60 percent of the elderberry plants and 60 percent of the associated native plants shall be maintained throughout the monitoring period.

Significance after Mitigation

Less than significant.

Impact BIO-4: Effects of project construction on special-status fishes.

In the Study Area, habitat for special-status fish species is generally limited to the San Joaquin River. During high flow events, some special-status fish species may occasionally enter natural drainages or ditches connected to the river. Several special-status fish species may occur in this reach of the San Joaquin River, including: Central Valley fall- and spring-run Chinook salmon, Central Valley steelhead, Sacramento splittail (*Pogonichthys macrolepidotus*), hardhead, San Joaquin roach (*Lavinia symmetricus*), and several species of lamprey (**Table 3.4-2**).

Adult Chinook salmon and steelhead migrate through the Study Area to reach spawning habitat in the Merced River. Juvenile salmonids pass through the Study Area on their way out to the Pacific Ocean. Sacramento splittail may be present in this portion of the river in wet years. Hardhead have recently been captured downstream near the confluence with the Stanislaus (Pers. Comm. Merz 2014). The status of San Joaquin roach in the Study Area is not well documented, but this species may be present. Lamprey likely migrate through this reach of the river to spawn in upstream tributaries. Ammocetes (lamprey larva) may be dispersed into this reach of the river. There have been anecdotal accounts of green sturgeon in the vicinity of the Study Area (Jackson and Van Eenennaam 2013), but this species is not expected to be present (Pers. Comm. Gutierrez, 2014).

Combined Alignment Alternative

Potential construction-related impacts to special-status fish and their habitat would be minimized by using trenchless construction techniques for crossing the San Joaquin River. If HDD is selected as the trenchless construction method, impacts to special-status fish and their habitat may result from a frac-out of drilling fluids. Drilling fluids typically consist of bentonite, which is non-toxic to aquatic life. However, a frac-out may result in a temporary increase in turbidity or sedimentation that can adversely affect aquatic organisms by covering spawning and feeding areas, and clogging fish gills. These impacts are considered potentially significant.

Mitigation Measure BIO-1d would be implemented to reduce impacts in the event of a frac-out and a Draft Sample Frac-out Prevention Plan for Horizontal Directional Drilling is included in **Appendix F**. With implementation of this mitigation measure, impacts would be less than significant.

Trenchless construction under the San Joaquin River is not expected to result in any noise or vibration impacts on fish in the river. Vibration from the drilling machinery is minimal and because the tunneling operation occurs from 15 to 50 feet below the river, it would be attenuated to an imperceptible level before it reaches the river bottom. No perceptible noise or vibration is expected to translate into the water (Pers. Comm. Glynn, 2014). There would be no adverse effects from noise or vibration from drilling machinery.

Construction of launching and receiving pits for trenchless construction would likely require installation of sheet pile cofferdams in upland locations adjacent to the San Joaquin River. Installation of sheet piles may require the use of impact pile driving equipment. Land-based pile driving has the potential to generate underwater noise that could adversely affect special-status fish.

The NMFS Pile Driving Calculator (NMFS 2012) was used to estimate the potential underwater noise-related effects to fish species from construction of launching and receiving pits. The highest values for land-based pile driving activities reported in the *Final Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish Appendix I Compendium of Pile Driving Sound Data* updated October 2012 (ICF Jones & Stokes and Illingworth & Rodkin 2012) were used to iteratively develop thresholds for pile driving that would be protective of fish. **Mitigation Measure BIO-4a** would be implemented to minimize impacts associated with land-based pile driving by limiting the number of strikes that can be made in a 24-hour period. With implementation of this mitigation measure, impacts would be less than significant.

Separate Alignment Alternative

Potential impacts would be similar to the combined alignment alternative, but there would be a greater chance for impacts special-status fish and their habitat because there would be two crossings of the San Joaquin River.

Mitigation Measure BIO-1d would be implemented as described for the Combined Alignment Alternative. With implementation of this mitigation measure, impacts would be less than significant.

PID Conveyance Alternative

Construction would require work within the San Joaquin River to expand the existing PID intake facility and fish screen. This could affect the special status fish species described above. It is expected that construction of the expanded intake would require construction similar to that completed for the existing PID Intake, which began operation in 2011. Construction would require placement and removal of a sheet-pile cofferdam to isolate the work site from the rest of the river. Potential effects of cofferdam installation could include impacts from noise and vibration associated with pile driving in the river. In-river cofferdam construction would also result in a temporary localized disturbance with minor siltation of the water. It is expected that placement of the cofferdam would have to take place between July 1 and September 30 which would minimize effects on fish, especially salmonids, because this is outside of their migratory period for this portion of the San Joaquin River (PID 2006). Length of time required for construction of the expanded intake has not been determined, but it is likely that construction within the cofferdam would not be completed by September 30, which would require that removal of the cofferdam take place the following year in the July 1 to September 30 construction window. It is expected that an Incidental Take Permit from the California Department of Fish and Wildlife would be required for construction and that a Biological Opinion would need to be obtained from NMFS.

Mitigation Measure BIO-4b would be implemented to reduce impacts of construction work within the San Joaquin River. With implementation of this mitigation measure, impacts would be less than significant. Measures to protect water quality, as described *in Section 3.11, Hydrology and Water Quality*, would also be implemented, and would protect special status fish species in the San Joaquin River.

No Action Alternative

Under the No Action Alternative, no new pipeline or pump station construction and operation would occur. Therefore, no impacts to special-status fish and their habitat would occur.

Significance Determination before Mitigation

Potentially significant for all action alternatives.

Mitigation Measures

See **Mitigation Measure BIO-1d (Alternatives 1 and 2).**

Mitigation Measure BIO-4a: Minimize Pile Driving-related Impacts to Special-status Fish (Alternatives 1 and 2)

If impact pile driving activities occur adjacent to the San Joaquin River between October 1 and May 31, the Project Proponents shall adhere to the restrictions on the number of allowable strikes for a 24 hour period provided in **Table 3.4-4**.

Table 3.4-4: Impact Pile Strike Restrictions for Protection of Special-status Fish

Distance from San Joaquin River (Meters)	Distance from San Joaquin River (Feet)	Maximum Number of Strikes per 24 hours[1]
75	246	130
150	492	365
225	738	672
300	984	1035
375	1230	1447
450	1476	1902
>450	>1476	no limit

[1] Calculations based on NMFS Pile Driving Calculations (NMFS 2012). Assumed peak sound level of 204 dB and SEL of 175 dB.

Mitigation Measure BIO-4b: Best Management Practices for In-River Intake Construction (Alternative 3)

Prior to construction of the expanded intake in the San Joaquin River, the Project Partners and PID would develop a program of Best Management Practices (BMPs) for in-river construction in consultation with the California Department of Fish and Wildlife, and NMFS. At minimum, the plan shall prescribe the measures to ensure protection of aquatic resources and special-status plants, including:

- Project construction and operations shall result in no net loss of wetland resources at the intake site.
- Work within the San Joaquin River shall only take place between July 1 and September 30. Work within the cofferdam will not be considered to be in-river construction.
- All construction contracts shall specify a fish salvage program for all dewatered areas as part of construction. All trapped fish and aquatic species within a dewatered work site will be removed and returned unharmed to the San Joaquin River.

Significance after Mitigation

Less than significant.

Impact BIO-5: Effects of project operations on special-status fishes.

Combined and Separate Alignment Alternatives

Currently, water from the Cities' WWTPs is discharged to the San Joaquin River where it contributes to existing flows and therefore provides potential biological benefits to fishery resources. For example, studies have shown positive relationships between the flow in the San Joaquin River during the spring (e.g., March-May) and the survival of juvenile salmon as well as adult salmon escapement 2.5 years later (Hanson 2013). Under the proposed project, the Cities would redirect WWTP discharges out of the San Joaquin River, which would result in an incremental reduction in river flows relative to the baseline condition.

An assessment of the impacts of the reduction of WWTP discharges was conducted as part of the feasibility study for the proposed project. Hanson Environmental (Hanson) prepared a report titled

Assessment of Potential Effects of the North Valley Regional Recycled Water Program Reductions in Freshwater Discharges into the San Joaquin River on Fishery Habitat and Juvenile Salmon Survival (Hanson 2013). This report is provided in **Appendix E**. The analysis focuses on the period from March through May because this is the critical time period when flows in the river can affect sensitive species. Flow reductions at other times in the year would not be expected to be biologically meaningful (see **Appendix E**).

The assessment report utilized Chinook salmon as the indicator species for evaluating the effects of the proposed project (Hanson 2013). Chinook salmon were selected as the indicator species because: (1) quantitative data on the relationships between San Joaquin River flows and habitat quality and availability, survival, and abundance are not available for other fish species inhabiting the river; and (2) Chinook salmon are a species sensitive to changes in instream flows and other environmental factors such as exposure to seasonally elevated water temperature when compared to the greater tolerance of many of the resident and other migratory fish that utilize the San Joaquin River as habitat (Kjelson et al. 1982, Mesick et al. 2007).

The two primary conclusions from the assessment were:

- Redirection of discharges from the Modesto and Turlock WWTPs away from the San Joaquin River would result in an incremental reduction in river flow from the point(s) of the existing discharge downstream. The reduction in San Joaquin River flow would contribute, based on the best scientific information available, to an incremental reduction in juvenile Chinook salmon survival during spring outmigration, a reduction in adult salmon escapement to the San Joaquin River tributaries, and an incremental reduction in habitat quality and availability in the lower river and estuary.
- The magnitude of predicted changes in juvenile salmon survival, adult escapement, and habitat conditions in the lower river and estuary was small (typically less than 1% when compared to current baseline conditions) and is well within the natural observed variation in the regression relationships used in these analyses. The magnitude of predicted changes in juvenile salmon survival and adult escapement, habitat quality and availability in the lower San Joaquin River, and the location of the estuarine low salinity zone (X2 location), would not be detectable in field studies and is considered to be less than significant.

Based on results of the assessment, redirection of the discharge of treated wastewater from the WWTPs at Modesto and Turlock away from the San Joaquin River would not be expected to result in a measureable effect on the population dynamics of Chinook salmon. Since Chinook salmon are among the most sensitive fish species to changes in instream flows and other associated environmental factors (e.g., exposure to seasonally elevated water temperatures: Kjelson et al. 1982, Mesick et al. 2007) the potential effects of the proposed redirection of WWTP discharges away from the river would be expected to be less for other resident and migratory fish inhabiting the San Joaquin River (Hanson 2013).

PID Conveyance Alternative

Similar to the Combined Alignment and Separate Alignment Alternatives, this alternative would slightly reduce flows in the San Joaquin River. The only difference is that the instead of discontinuing discharges, both Turlock and Modesto would continue to discharge at their existing discharge locations, and the water would be diverted at the PID intake. This would result in slightly more water in the river for the 3.6 miles between the Turlock discharge location at the Harding Drain Bypass pipeline and the intake, and slightly less water in the river between the PID intake and the existing Modesto discharge location, which is downstream of the intake. Downstream of the Modesto discharge, the amount of water in the river would be the same as for Alternatives 1 and 2. This alternative thus would result in the same incremental reduction in river flows relative to the baseline condition, and would not be expected to result in a measureable effect on the population dynamics of Chinook salmon or other resident and migratory fish inhabiting the San Joaquin River (Hanson 2013).

No Action Alternative

Under the No Action Alternative, no change in operations would occur. Therefore, there would be no new impacts to special-status fish and their habitat.

Significance Determination before Mitigation

Less than significant for all action alternatives.

Impact BIO-6: Effects on giant garter snake.

The natural drainage on the east side of San Joaquin River (**Figure 3.4-1**, Sheets 7-10) and freshwater wetlands within the river provide potentially suitable aquatic habitat for giant garter snake (GGS). The Harding Drain and other large ditches with emergent vegetation provide marginal aquatic habitat for this species. Uplands adjacent to these aquatic sites provide basking sites and refugia.

GGS were not observed in the Harding Drain or San Joaquin River during pre-construction surveys conducted for the Harding Drain Bypass Project (Horizon 2014a) . The closest known occurrence is approximately 13 miles south of the Study Area in Merced County near Gustine, CA (CDFW 2014). The San Joaquin River may function as a dispersal corridor between GGS populations to the south and north.

Combined Alignment Alternative

Potential impacts to GGS would be minimized by using trenchless construction techniques in aquatic habitats where GGS may occur. Potential upland habitat adjacent to aquatic habitat in the San Joaquin River would be avoided because entry and pullback pits for HDD construction would be on the land-side of the river levees and greater than 200 feet from suitable aquatic habitat. The proposed pipeline alignment would cross the natural drainage on the east side of the San Joaquin River up to three times (**Figure 3.4-1**, Stations 373+00. 436+00, and 562+50). Approximately 54,000 square feet (1.24 acres) of potential GGS upland habitat would be temporary disturbed during construction . This would temporarily reduce the amount and quality of upland habitat available to GGS. If GGS are present in upland areas during construction, injury or mortality to individuals could result while operating construction equipment for site preparation (i.e., clearing and grubbing). However, harm or mortality of individual GGS is considered unlikely because snakes would likely sense vibration from construction equipment and disperse from the work area.

Mitigation Measure BIO-6 would be implemented to avoid or minimize these potential impacts by avoiding suitable habitat for GGS to the extent feasible. Where disturbance of potentially suitable habitat is unavoidable, **Mitigation Measure BIO-6** would minimize impacts by requiring pre-construction surveys, on-site biological monitoring, restricting the location of certain construction activities, and restoration of impacted areas to pre-construction conditions. With implementation of this mitigation measure, impacts would be less than significant.

Separate Alignment Alternative

Potential impacts to GGS would be similar to the Combined Alignment Alternative. There would be a greater chance for impacts to GGS that may occur in wetlands along the San Joaquin River because there would be two crossings of the San Joaquin River. There would be no potential for impacts in the natural drainage on east side of San Joaquin River because this alternative does not cross that drainage. These impacts are considered potentially significant.

Mitigation Measure BIO-6 would be implemented as described for the Separate Pipeline Alternative. With implementation of this mitigation measure, impacts would be less than significant.

PID Conveyance Alternative

Potential impacts to GGS would be similar to the Separate Alignment Alternative. There would be a greater chance for impacts to GGS that may occur in wetlands along the San Joaquin River because work

would be conducted both within the river and in adjacent upland habitat. Although PID has determined that habitat for GGS at their existing intake site is very limited because of a lack of vegetation and high level of human disturbance (PID 2006), these impacts are still considered potentially significant.

Mitigation Measure BIO-6 would be implemented as described for the Combined and Separate Pipeline Alternatives. With implementation of this mitigation measure, impacts would be less than significant.

No Action Alternative

Under the No Action Alternative, no new pipeline or pump station construction and operation would occur. Therefore, no impacts to GGS would occur.

Significance Determination before Mitigation

Potentially significant for all action alternatives.

Mitigation Measures

Mitigation Measure BIO-6: Avoid and Minimize Impacts to Giant Garter Snake (Alternatives 1, 2 and 3)

The following measures shall be implemented to avoid or minimize impacts to GGS:

- Trenchless construction techniques shall be used to construct the pipeline crossing in potential aquatic habitat for GGS (applicable to Alternatives 1 and 2 only);
- Construction personnel shall participate in a Contractor Environmental Awareness Training (CEAT). Under this program, workers shall be informed about GGS and habitat, the species life history, conservation goals, identification of the snake, and procedures to follow in the event of a possible sighting;
- Within 24-hours prior to commencement of construction activities, the site shall be inspected by a qualified biologist who is approved by the USFWS. The biologist shall provide the Service with a field report form documenting the monitoring efforts within 24-hours of commencement of construction activities. A qualified biologist shall be on-site during all construction activity within 200 feet of potential habitat for GGS (Survey areas for the Combined and Separate Alignment Alternatives are shown in **Table 3.4-3 and Figure 3.4-1**; for the PID Conveyance Alternative surveys shall take place at the intake site). If a snake is encountered during construction activities, the biologist shall have the authority to stop construction activities until appropriate corrective measures have been completed or it is determined that the snake would not be harmed;
- Erosion control materials including silt curtains, silt fencing, and erosion control wattles shall be regularly inspected for entanglement or entrapment of the snake. No erosion control devices containing plastic netting (including photo- or biodegradable plastic netting) shall be used;
- Stockpiling of construction materials, portable equipment, vehicles, and supplies shall be restricted to the designated construction staging areas which shall be greater than 200 feet from GGS aquatic habitat;
- Clearing of wetland vegetation, if any, shall be confined to the minimal area necessary to construct the pipeline or intake; and
- After completion of construction activities, any temporary fill and construction debris shall be removed. Disturbed areas shall be restored to pre-project conditions. Restoration work shall include replanting native emergent vegetation, where appropriate.

Significance after Mitigation

Less than significant.

Impact BIO-7: Effects on San Joaquin whipsnake.

Potentially suitable habitat for San Joaquin whipsnake occurs in saltbush scrub on the river side of San Joaquin River levee near Station 1335 (**Figure 3.4-1**, Sheet 11). This species was not observed in this location during surveys conducted for the Harding Drain Bypass Project (Horizon 2014a). Lack of burrows or other refuge in alkali flat/scrub between Stations 553+00 to 563+00 make this area unsuitable for San Joaquin whipsnake.

Combined Alignment Alternative

This alternative would not impact San Joaquin whipsnake because it does not cross potentially suitable habitat.

Separate Alignment Alternative

Potential impacts to San Joaquin whipsnake would be minimized by using trenchless construction techniques in areas where this species may occur (i.e., river side of San Joaquin River levee near Station 1335). The potential for this species to be impacted by a frac-out is considered to be highly unlikely. Impacts are considered less than significant.

PID Conveyance Alternative

This alternative would not affect San Joaquin whipsnake because it does not cross potentially suitable habitat.

No Action Alternative

Under the No Action Alternative, no new pipeline or pump station construction and operation would occur. Therefore, no impacts to San Joaquin whipsnake would occur.

Significance Determination before Mitigation

Less than significant for all action alternatives.

Impact BIO-8: Effects on western pond turtle.

Potentially suitable habitat for western pond turtle occurs in the San Joaquin River and natural drainages. Irrigation ditches with emergent vegetation provide marginally suitable habitat because they generally lack basking sites, the banks are very steep, and they are not perennially inundated.

Combined Alignment Alternative

Potential impacts to western pond turtle would be minimized by using trenchless construction techniques in areas where this species is most likely to occur. However, the precise construction methods are not known at this time, and western pond turtle may occur in upland areas. Construction activities that directly impact western pond turtle or their nests have the potential to result in significant impacts to this species.

Mitigation Measure BIO-8 would avoid impacts to suitable habitat for this species to the extent feasible. Where disturbance of suitable habitat is unavoidable, the mitigation measure would require that impacts be minimized through pre-construction surveys, establishment of buffers, and monitoring. With implementation of this mitigation measure, impacts would be less than significant.

Separate Alignment Alternative

Potential impacts would be similar to the Combined Alignment Alternative, but there would be a greater chance for impacts to western pond turtle because there would be two crossings of the San Joaquin River.

Mitigation Measure BIO-8 would be implemented as described for the Separate Alignment Alternative. With implementation of this mitigation measure, impacts would be less than significant.

PID Conveyance Alternative

Potential impacts would be similar to the Combined Alignment Alternative, but there would be a greater chance for impacts to western pond turtle because there would construction within the San Joaquin River, which contains moderate to low quality habitat for western pond turtle within and near the shores of the river. Impacts of construction of the expanded intake facility would be potentially significant.

Mitigation Measure BIO-8 would be implemented as described for the Combined and Separate Pipeline Alternatives. With implementation of this mitigation measure, impacts would be less than significant.

No Action Alternative

Under the No Action Alternative, no new pipeline or pump station construction and operation would occur. Therefore, no impacts to western pond turtle would occur.

Significance Determination before Mitigation

Potentially significant for all action alternatives.

Mitigation Measures

Mitigation Measure BIO-8: Avoid and Minimize Impacts to Western Pond Turtle (Alternatives 1, 2 and 3)

The following measures shall be implemented to avoid or minimize impacts to western pond turtle:

- To the extent feasible, trenchless construction techniques shall be used where pipelines cross potential aquatic habitat for western pond turtle;
- Construction personnel shall participate in a Contractor Environmental Awareness Training (CEAT). Under this program, workers shall be informed about western pond turtle and their habitat, conservation goals, identification, and procedures to follow in the event of a possible sighting; and
- Pre-construction surveys for western pond turtle shall be conducted by a qualified biologist 14 days before and 24 hours before the start of construction activities where suitable habitat exists (Survey areas for the Combined and Separate Alignment Alternatives are shown in **Table 3.4-3 and Figure 3.4-1**; for the PID Conveyance Alternative surveys shall take place at the intake site). If western pond turtle or their nests are observed during pre-construction surveys, the following measures shall be implemented:
    - A qualified biologist shall be on site to monitor construction in suitable habitat. If a western pond turtle is present within 50 feet of a construction area, no vegetation clearing or ground disturbing activities shall be conducted until the turtle leaves the area on its own volition.
    - If western pond turtle nests are identified in the work area during pre-construction surveys, a 100-foot no-disturbance buffer shall be established between the nest and any areas of potential disturbance. Buffers shall be clearly marked with temporary fencing. Construction shall not be allowed to commence in the exclusion area until hatchlings have emerged from the nest, or the nest is deemed inactive by a qualified biologist.

Significance after Mitigation

Less than significant.

Impact BIO-9: Effects on burrowing owl.

Potential habitat for burrowing owls occurs in several locations throughout the Study Area, including unvegetated areas adjacent to the DMC and in ruderal and agricultural habitats with burrows. Evidence of this species was not observed during site reconnaissance and few burrows were observed in the Study Area (Horizon 2014b). However, this species may disperse and colonize suitable habitat within the Study Area.

Combined Alignment Alternative

If present in the vicinity of the Study Area, construction could disturb burrowing owls through noise, visual distraction, or direct impacts to occupied habitat. These impacts would be considered potentially significant.

Mitigation Measure BIO-9 is proposed to avoid impacts to this species, to the extent feasible. Where disturbance is unavoidable, impacts to burrowing owls would be minimized through establishing buffers around active burrows. If active burrows cannot be avoided, passive relocation techniques may be used. If relocation occurs, then compensation would be provided to offset impacts. With implementation of this mitigation measure, impacts would be less than significant.

Separate Alignment Alternative

Potential impacts would be similar to the Combined Alignment Alternative, but there would be a greater chance for impacts because this alternative crosses a larger area of potentially suitable habitat.

Mitigation Measure BIO-9 would be implemented as described for the Separate Alignment Alternative. With implementation of this mitigation measure, impacts would be less than significant.

PID Conveyance Alternative

Potential impacts would be similar to the Combined and Separate Alignment Alternatives, as moderate to low quality habitat for burrowing owl occurs near the PID intake site and along the Main Canal.

Mitigation Measure BIO-9 would be implemented as described for the Separate Pipeline Alternative. With implementation of this mitigation measure, impacts would be less than significant.

No Action Alternative

Under the No Action Alternative, no new pipeline or pump station construction and operation would occur. Therefore, no impacts to burrowing owls would occur.

Significance Determination before Mitigation

Potentially significant for all action alternatives.

Mitigation Measures

Mitigation Measure BIO-9: Avoid, Minimize, or Compensate for Impacts to Burrowing Owl (Alternatives 1, 2 and 3)

Prior to initiating ground-disturbing activities, surveys for burrowing owls shall be conducted in accordance with protocols established in the *Staff Report on Burrowing Owl Mitigation* (CDFG 2012 or current version). If ground-disturbing activities are delayed or suspended for more than 30 days after the pre-construction survey, the site shall be resurveyed. If burrowing owls are detected, disturbance to burrows shall be avoided during the nesting season (February 1 through August 31). Buffers shall be established around occupied burrows in accordance with guidance provided in the *Staff Report on Burrowing Owl Mitigation*, and at the discretion of a qualified wildlife biologist. Buffers around occupied burrows shall be a minimum of 656 feet (200 meters) during the breeding season, and 160 feet (100 meters) during the non-breeding season. Buffer distances shall be subject to the approval of CDFW.

If occupied burrows cannot be avoided, passive owl relocation techniques may be implemented outside of the nesting season (February 1 through August 31). Owls would be excluded from burrows within 160 feet of construction by installing one-way doors in burrow entrances. The work area shall be monitored daily for 1 week to confirm owl departure from burrows prior to any ground-disturbing activities. Where possible burrows shall be excavated using hand tools and refilled to prevent reoccupation. Sections of flexible plastic pipe shall be inserted into the tunnels during excavation to maintain an escape route for any animals inside the burrow.

If occupied burrows are relocated, the Partners Agencies shall enhance or create burrows in adjacent habitat at a 1:1 ratio (burrows destroyed to burrows enhanced or created) one week prior to implementation of passive relocation techniques. If burrowing owl habitat enhancement or creation takes place, the Partners Agencies shall develop and implement a monitoring and management plan to assess the effectiveness of the mitigation. The plan shall be subject to the approval of CDFW.

Significance after Mitigation

Less than significant.

Impact BIO-10: Effects on tricolored blackbird.

Potential habitat for tricolored blackbird occurs in the natural drainage on the east side of San Joaquin River (**Figure 3.4-1**, Sheets 7-10), freshwater wetlands within the river, and some agricultural fields planted with silage or grain. The Harding Drain and other large ditches with emergent vegetation provide marginal nesting habitat for this species. A tricolored blackbird breeding colony was documented in 2014 in the natural drainage on the east side of the San Joaquin River (**Figure 3.4-1**, Sheet 7, Station 375) (UC Davis 2014).

Combined Alignment Alternative

Potential impacts to tricolored blackbird would be minimized by using trenchless construction techniques in areas that support emergent vegetation. However, this species may nest in agricultural fields and construction could disrupt nesting through noise, visual distraction, or otherwise cause behavioral modifications. While the proposed project would not permanently modify nesting habitat for tricolored blackbirds, nest failure would be considered a potentially significant impact.

Mitigation Measure BIO-10 would be implemented to avoid and minimize potential impacts to tricolored blackbird. This mitigation measure includes pre-construction surveys during the nesting season and establishing buffers around active nests. With implementation of this mitigation measure, impacts would be less than significant.

Separate Alignment Alternative

Potential impacts would be similar to the Combined Alignment Alternative and are considered potentially significant. Note that this alternative would not cross the natural drainage where a breeding colony was observed in 2014.

Mitigation Measure BIO-10 would be implemented as described for the Separate Alignment Alternative. With implementation of this mitigation measure, impacts would be less than significant.

PID Conveyance Alternative

Surveys of the PID intake site determined that there was no suitable habitat present at the intake (PID 2006). However, the pipeline alignment could traverse areas adjacent to silage and grain fields, which provide potential habitat for tricolored blackbird. Impacts would be similar to those for the Combined and Separate Alignment Alternatives.

No Action Alternative

Under the No Action Alternative, no new pipeline or pump station construction and operation would occur. Therefore, no impacts to tricolored blackbirds would occur.

Significance Determination before Mitigation

Potentially significant for all action alternatives.

Mitigation Measures

Mitigation Measure BIO-10: Avoid and Minimize Impacts to Tricolored Blackbird Nesting Colonies (Alternatives 1, 2 and 3)

The following measures shall be implemented to avoid or minimize impacts to tricolored blackbird:

- To the extent feasible, trenchless construction techniques shall be used in areas that support emergent vegetation;
- During the breeding season (February 1 through August 31), pre-construction surveys for tricolored blackbird shall be conducted in suitable nesting habitat by a qualified biologist no more than 15 days prior to scheduled work. Suitable nesting habitat includes any of the following: (a) dense vegetation near open water; (b) emergent marsh vegetation, especially cattails and bulrush; (c) thickets of willow, blackberry, wild rose, or thistles; or (d) silage and other grain fields such as sorghum; and
- If tricolored blackbird breeding is detected, a 500 foot no-disturbance buffer shall be established around the breeding site. The buffer shall be maintained until a qualified biologist has determined that young have fledged and are no longer reliant upon the nest or parental care for survival.

Significance after Mitigation

Less than significant.

Impact BIO-11: Effects on golden eagle and bald eagle.

Golden eagle and bald eagle are State Fully Protected species. CDFW cannot authorize take of these species. Golden eagles are commonly observed in the canyons/foothills to the west of the Study Area (ebird.org 2014). The grasslands and oak woodlands of the Diablo Range support a high density of nesting golden eagles. In central California, golden eagles nest primarily in large trees and cliffs within open grasslands and oak savanna, and occasionally in oak woodland and open shrublands (Hunt et al. 1999). The Study Area provides marginal foraging habitat and nesting is unlikely.

Bald eagles have been observed in canyons/foothills to the west of the Study Area and at Modesto WTP (ebird.org 2014). In California, the majority of bald eagles nest in conifer trees near reservoirs (Jackman and Jenkins 2004). Typically, bald eagles forage near open water (rivers, lakes, reservoirs) where fish or waterfowl are abundant (USFS 2007).The San Joaquin River, and possibly the Modesto WTP, provide potential foraging habitat. Large trees along the San Joaquin River are potential roost sites. Bald eagles are generally winter visitors in the Central Valley; nesting within the vicinity of the Study Area is unlikely. There are no published reports of nest sites on the San Joaquin Valley floor.

Combined Alignment Alternative

Potential impacts to non-breeding golden and bald eagles may include visual distractions, noise, and possibly temporary displacement from suitable foraging areas. Project activities are not likely to reduce fitness, affect breeding, result in "take" of these species, or result in any substantial adverse impacts to eagles. Therefore, potential impacts to golden and bald eagles are considered to be less than significant.

Separate Alignment Alternative

Potential impacts would be similar to the Combined Alignment Alternative. These potential impacts are considered to be less than significant.

PID Conveyance Alternative

Potential impacts would be similar to the Combined Alignment Alternative. These potential impacts are considered to be less than significant.

No Action Alternative

Under the No Action Alternative, no new pipeline or pump station construction and operation would occur. Therefore, no impacts to golden and bald eagles would occur.

Significance Determination before Mitigation

Less than significant for all action alternatives.

Impact BIO-12: Effects on raptors including special-status species.

Numerous raptors utilize habitats in the Study Area for nesting and foraging. Non-listed raptors commonly observed in the vicinity of the Study Area include red-tailed hawk, American kestrel, red-shouldered hawk, and merlin, among others. Special-status raptors (excluding bald eagle, golden eagle, and burrowing owls) known to occur in the vicinity of the Study Area include Swainson's hawk, white-tailed kite, and northern harrier (**Table 3.4-2**). These species have been observed in the Study Area and are known to nest locally. Riparian trees along the San Joaquin River and the natural drainage to the west provide potential nesting habitat for Swainson's hawk and white-tailed kite; isolated mature trees in adjacent fields may also be used for nesting. These raptors commonly forage in agricultural fields. Northern harriers nest on the ground in open areas, including some agricultural fields.

Combined Alignment Alternative

Construction in the vicinity of raptor nest sites could disturb nesting raptors through generation of noise, visual distraction, or direct impacts to occupied nests (e.g., tree removal or ground disturbance). Potential impacts to Swainson's hawk and white-tailed kite would be minimized by using trenchless construction techniques for crossing of the San Joaquin River, where nesting is most likely to occur. However, construction of the San Joaquin River crossing is anticipated to take 8 to 10 months and special-status raptors could nest in relatively close proximity to trenchless construction operations. Thus, there would be the potential for disturbance of nesting raptors. Impacts that result in nest abandonment, nest failure, or reduced health or vigor of nestlings are considered potentially significant.

Construction in agricultural lands could impact northern harrier nests and would cause temporary loss of suitable foraging habitat Swainson's hawk and white-tailed kite. Given the amount of available foraging habitat, this is not likely to result in substantial adverse impacts to Swainson's hawk and white-tailed kite. Disturbance of a northern harrier nest is considered a potentially significant impact.

Mitigation measures are proposed to avoid, minimize, or compensate for these potential impacts. **Mitigation Measure BIO-12** would avoid or minimize impacts to active nests for these species and require compensatory mitigation for impacts to nesting habitat. With implementation of this mitigation measure, impacts would be less than significant.

Separate Alignment Alternative

Potential impacts would be similar to the Combined Alignment Alternative, but there would be two crossings of the San Joaquin River, and thus a greater chance for distractions, noise, and temporary displacement in higher quality nesting areas. This alternative would also temporarily impact a larger area

of suitable foraging habitat for Swainson's hawk and white-tailed kite (although still not considered a substantial adverse impact) and potential nesting habitat for northern harrier.

Mitigation Measure BIO-12 would be implemented as described for the Separate Alignment Alternative. With implementation of this mitigation measure, impacts would be less than significant.

PID Conveyance Alternative

Potential impacts would be similar to the Combined Alignment Alternative, but construction would take place within the San Joaquin River. This alternative would also potentially cause temporary impact to suitable foraging habitat for Swainson's hawk and white-tailed kite (although still not considered a substantial adverse impact) and potential nesting habitat for northern harrier.

Implementation of **Mitigation Measure BIO-12** would reduce impacts to less than significant.

No Action Alternative

Under the No Action Alternative, no new pipeline or pump station construction and operation would occur. Therefore, no impacts to raptors would occur.

Significance Determination before Mitigation

Potentially significant for all action alternatives.

Mitigation Measures

Mitigation Measure BIO-12: Avoid, Minimize, or Compensate for Impacts to Raptors including Special-status species (Alternatives 1, 2 and 3)

- If ground and vegetation disturbing activities occur between February 1 and September 15, a nesting raptor survey, with a focus on Swainson's hawk and white-tailed kite, shall be conducted in accordance with *Recommended Timing and Methodology for Swainson's Hawk Nesting Survey's in California's Central Valley* (Swainson's Hawk Technical Advisory Committee 2000, or current CDFW guidance). Surveys shall cover a minimum of a 0.5-mile radius around potentially suitable nesting habitat for Swainson's hawk and white-tailed kite (Survey areas for the Combined and Separate Alignment Alternatives are shown in **Table 3.4-3 and Figure 3.4-1**; for the PID Conveyance Alternative surveys shall take place at the intake site). Agricultural lands within 1,000 feet of open-cut construction areas shall be surveyed for northern harrier nests.
- If nesting raptors are detected, a no-disturbance buffer shall be established around the nest. Buffers shall be 0.25 mile for Swainson's hawk and white-tailed kite, and 500 feet for northern harrier and non-listed raptors. A qualified biologist may identify an alternative buffer based on a site specific-evaluation and in consultation with CDFW. No construction activities shall be initiated within the buffer until fledglings are fully mobile and no longer reliant upon the nest or parental care for survival. Construction must either be started before nests are established, or if nesting birds are already present, construction within the buffer zone would have to be delayed until nesting is done for the season.
- If an active Swainson's hawk or white-tailed kite nest is located within a 0.5-mile radius of an active work area, a biologist shall be on site daily to monitor the nest. The biologist shall monitor for behavioral changes that would suggest the birds are stressed by construction activity or the nest may be abandoned. Such behaviors may include excessive vocalization, a startled response coincident with a loud noise or changes in the viewshed, or prolonged absence from the nest by adults. If the biologists determines that nest success may be adversely impacted by construction, then construction shall be discontinued within 0.5 mile of the nest.

- Trees that would need to be removed for construction would be surveyed to determine if they are suitable for raptor nesting.
- If potential raptor nesting trees are to be removed during construction activities, removal shall take place outside of Swainson's hawk nesting season. Suitable nest trees for raptors shall be replaced at a ratio of 3:1 with appropriate species [e.g., valley oak (*Quercus lobata*), coast live oak (*Q. agrifolia*)., Fremont cottonwood (*Populus fremontii*)]. The trees shall be planted within 5 miles of the removal location, in areas appropriate for raptor nesting, and on land owned or managed by one of the Partner Agencies. If replacement planting is implemented, monitoring shall be conducted annually for 5 years to assess the mitigation's effectiveness. The performance standard for the mitigation shall be 65% survival of all replacement plantings.

Significance after Mitigation

Less than significant.

Impact BIO-13: Effects on special-status passerine species and birds protected under the MBTA.

Special-status passerines that may nest in the vicinity of the Study Area include tricolored blackbird (see **Impact BIO-9**), loggerhead shrike (*Lanius ludovicianus)*, and yellow warbler (*Dendroica petechia*). Historically, riparian habitat in the vicinity of the Study Area was important breeding habitat for least Bell's vireo (LBV) (*Vireo bellii pusillus*). In June 2005, a LBV nest was founded in a riparian restoration site at the San Joaquin River National Wildlife Refuge, which is approximately 10 mile north of the Project Area. Prior to 2005, no LBV nests had been confirmed in the Central Valley for over 50 years. There is a historic record of LBV from the late 1920s in Del Puerto Canyon, which is west of the action. In the Study Area, riparian scrub in the vicinity of Stations 320+00 to 333+00 (**Figure 3.4-1**, Sheet 6) provides potentially suitable breeding habitat for LBV, though vegetation cover may not be quite as dense the species' preferred breeding habitat. Many species of birds protected under the MBTA may also nest in the Study Area.

Combined Alignment Alternative

Construction could disturb nesting passerines through generation of noise, visual distraction, or direct impacts to occupied nests (e.g., vegetation removal or ground disturbance). Potential impacts would be minimized by using trenchless construction techniques for crossing sensitive habitat (e.g., San Joaquin River), where nesting is most likely to occur. However, the potential for disturbance of nests remains, and nest failure or removal of a nest are considered potentially significant impacts.

Mitigation Measure BIO-13 would minimize potential impacts to passerines by conducting pre-construction surveys during the nesting season and establishing buffers around active nests. With implementation of this mitigation measure, impacts would be less than significant.

Separate Alignment Alternative

Potential impacts would be similar to the Combined Alignment Alternative, but there would be two crossings of the San Joaquin River, and thus a greater chance for distractions, noise, and temporary displacement in higher quality nesting areas.

Mitigation Measure BIO-13 would be implemented as described for the Separate Alignment Alternative. With implementation of this mitigation measure, impacts would be less than significant.

PID Conveyance Alternative

Potential impacts would be similar to the Combined Alignment Alternative.

Implementation of **Mitigation Measure BIO-13** would reduce impacts to less than significant.

No Action Alternative

Under the No Action Alternative, no new pipeline or pump station construction and operation would occur. Therefore, no impacts to special-status passerines or other birds protected under the MBTA.

Significance Determination before Mitigation

Potentially significant for all action alternatives.

Mitigation Measures

Mitigation Measure BIO-13: Avoid and Minimize Impacts to Special-status passerine species and other Birds Protected under the MBTA (Alternatives 1, 2 and 3)

- If ground and vegetation disturbing activities occur between February 1 and September 15, a survey for nesting birds shall be conducted within a 500-ft radius of the construction area. If nests are detected, buffers around nests shall be established. No-disturbance buffers around special-status passerine nests shall be 500 feet and 250 feet for non-listed birds protected under the MBTA and Fish and Game Code sections 3503 and 3513, unless a qualified CDFW biologist determines that smaller buffers shall be sufficient to minimize impacts to nesting birds. Factors to be considered for determining buffer size shall include: the presence of natural buffers provided by vegetation or topography; nest height; locations of foraging territory; and baseline levels of noise and human activity. Buffers shall be maintained until a qualified biologist has determined that young have fledged and are no longer reliant upon the nest or parental care for survival.
- Prior to commencing a crossing(s) of the San Joaquin River or construction of an expanded intake facility on the river, the Project Partners shall conduct surveys for LBV in accordance with USFWS' Least Bell's Vireo Survey Guidelines (USFWS 2011a). If LBV are detected during the surveys, the Project Partners shall consult with the USFWS to determine appropriate avoidance measures. The performance standard for avoidance shall be no potential impacts to an established LBV nest. This shall be accomplished by establishing a no-disturbance buffer around the active nest. The no-disturbance buffer shall be a minimum of 500 feet, but may be larger depending on site specific conditions and consultation with USFWS.

Significance after Mitigation

Less than significant.

Impact BIO-14: Effects on special-status mammals.

Special-status mammals with the potential to occur in the Study Area include western red bat (*Lasiurus blossevillii*), American badger (*Taxidea taxus*), and San Joaquin kit fox (SJKF). Western red bats may roost in trees along the San Joaquin River and large trees along the natural drainages to the west of the river. The drier areas of the San Joaquin River floodplain provide foraging and dispersal habitat for badgers. Habitat for badgers was not observed in open-cut portions of the Study Area.

The vast majority of the Study Area is comprised of roadways surrounded by intensively cultivated lands. These areas may be utilized by SJKF for dispersal and occasional foraging, but are not suitable for extended periods of occupation (USFWS 2010). A small remnant patch of alkali flat/scrub habitat is located on the south side of West Main Avenue (**Figure 3.4-1**, Sheet 9, Station 553+00 to 563+00). While this area is representative of typical habitat occupied by SJKF, it is small and isolated from large tracts of suitable habitat. Furthermore, no burrows were observed in the alkali flat/scrub habitat during 2014 reconnaissance-level surveys (Horizon 2014b), which suggests lack of ground squirrels (a principal prey resource) and den sites. Due to very limited extent of suitable habitat, this species is considered unlikely to occur in the Project Area. However, construction activities could create temporary barriers to

movement and dispersal of SJKF. Potential impacts to movement would be minimized by implementation of **Mitigation Measure TR-2**, which requires that trenches be covered at the end of each work day. Potential impacts to SJKF would be further minimized by implementing **Mitigation Measure BIO-14a**, which requires pre-construction surveys for SJKF dens and additional avoidance or minimization measures.

Combined Alignment Alternative

Potential impacts to western red bat and American badger would be minimized by using trenchless construction techniques in the riparian areas where these species may occur. Impacts to badger dens or trees that provide bat roost could result from a frac-out, but this is considered unlikely, and the effects to these species likely would be insubstantial. These impacts are considered to be less than significant. Impacts to SJKF are considered unlikely, but would be potentially significant if the species is found in the project area. **Mitigation Measure BIO-14a** would reduce impacts to less than significant.

Separate Alignment Alternative

Potential impacts would be similar to the Combined Alignment Alternative, but there would be a greater chance for impacts in riparian areas because there would be two crossings of the San Joaquin River. Potential impacts to western red bat and American badger would remain less than significant. **Mitigation Measure BIO-14a** would reduce potential impacts to SJKF to less than significant.

PID Conveyance Alternative

Similar to the Combined and Separate Alignment Alternatives, **Mitigation Measure BIO-14a** would reduce potential impacts to SJKF to less than significant. Evaluation of the PID intake site determined that the area may be used by special status bats for foraging and night roosts. Bats may use buildings on site or trees, including large-diameter snags (dead trees), in the adjacent riparian area as day roosts (PID 2006). Implementation of **Mitigation Measure BIO-14b** would reduce impacts to bats to less than significant.

Operation and maintenance of any of the action alternatives is not expected to adversely impact these species.

No Action Alternative

Under the No Action Alternative, no new pipeline or pump station construction and operation would occur. Therefore, no impacts to western red bat and American badger would occur.

Significance Determination before Mitigation

Potentially significant for all action alternatives.

Mitigation Measures

Mitigation Measure BIO-14a: Avoid and Minimize Impacts to San Joaquin kit fox (Alternatives 1, 2 and 3)

- Project-related activities will avoid affecting the alkali scrub/flat habitat in the action area. Avoidance is defined as no direct or indirect effects to habitat.
- A qualified biologist will conduct preconstruction surveys no less than 14 days and no more than 30 days before the commencement of activities to identify potential dens more than 5 inches in diameter within 200 feet of ground disturbing activities. The Project Partners will implement USFWS' (2011b) *Standardized Recommendations for Protection of San Joaquin Kit Fox Prior to or During Ground Disturbance*. The Project Partners will notify USFWS in writing of the results of the preconstruction survey within 30 days after these activities are completed.

- If potential dens are located within the proposed work area and cannot be avoided during construction activities, a USFWS-approved biologist will determine if the dens are occupied. If occupied dens are present within the proposed work, their disturbance will be avoided. Exclusion zones will be implemented following the most current USFWS procedures (currently USFWS 2011b). The Project Partners will notify USFWS immediately if a natal or pupping den is found in the survey area, and will present the results of pre-activity den searches within 5 days after these activities are completed and before the start of construction activities in the area.

Mitigation Measure BIO-14b: Avoid and Minimize Impacts to Special-status bats (Alternative 3)

- Construction at the PID intake site shall not take place after sunset or before sunrise.
- Any snags measuring at least 20 inches in diameter shall be inspected by a qualified biologist for potential bat use prior to removal. Should a bat roost be discovered in a snag, CDFW shall be notified to develop appropriate mitigation measures (such as exclusionary nets).

Significance after Mitigation

Less than significant.

Impact BIO-15: Effects on riparian habitat and other sensitive natural communities.

The majority of the project would be constructed in agricultural lands, road shoulders, or other disturbed and previously developed lands. However, portions of the alternative alignments cross through sensitive natural communities as identified by CDFW (CDFG 2010). Sensitive natural communities in the Study Area include:

- Black willow thickets – *Salix gooddingii* (Alliance code 71.040.05): This is the dominant natural community in the San Joaquin River floodplain;
- Great Valley Valley Oak Riparian Forest - *Quercus lobata*/grass (Alliance code 71.040.05): This community occurs on the high floodplain bench in the vicinity of Station 1310+00 (**Figure 3.4-1**, Sheet 17);
- Alkali heath marsh - F*rankenia salina / Distichlis spicata* (Alliance code 52.500.04): This community occurs on the south side of West Main Avenue (**Figure 3.4-1**, Sheet 9, Station 553+00 to 563+00); and
- Valley Sink Scrub - *Allenrolfea occidentalis* (Alliance code 36.120.04): This community occurs on the south side of West Main Avenue (**Figure 3.4-1**, Sheet 9, Station 553+00 to 563+00).

Combined Alignment Alternative

Potential adverse impacts to riparian areas and sensitive natural communities would be minimized by using trenchless construction techniques in these areas. However, the precise pipeline alignment and construction methods are not known at this time. Impacts to riparian areas and sensitive natural communities may result from sedimentation or alteration in drainage patterns. These impacts are considered potentially significant. Implementation of **Mitigation Measure BIO-1d and Mitigation Measure BIO-2a** would reduce impacts to a level that is less than significant.

Separate Alignment Alternative

Potential impacts to riparian areas and sensitive natural communities would be similar to the Combined Alignment Alternative, but there would be a greater chance for impacts in riparian areas because there would be two crossings of the San Joaquin River. There would be no potential impacts to Alkali health marsh and Valley Sink Scrub habitats between Stations 553+00 to 563+00 (**Figure 3.4-1**, Sheet 9) because the route for this alternative does not cross that area. Implementation of **Mitigation Measure BIO-1d** would reduce impacts to a level that is less than significant.

PID Conveyance Alternative

Construction of the existing intake, which was completed in 2011, removed riparian habitat at the site, and the area adjacent to the intake now has less riparian vegetation than was present before construction of the new intake. However, there is a potential that expansion of the intake facility, which would require construction in the San Joaquin River channel, would result in loss of some of the remaining riparian vegetation at the site, which would be considered a significant impact. Expansion of the intake could affect riparian forest and mixed willow riparian habitat.

Mitigation Measure BIO-16a and **Mitigation Measure BIO-16b** would reduce impacts to less than significant.

No Action Alternative

Under the No Action Alternative, no new pipeline or pump station construction and operation would occur. Therefore, no impacts to sensitive natural communities would occur.

Significance Determination before Mitigation

Potentially significant for all action alternatives.

Mitigation Measures

See **Mitigation Measures BIO-1d (Alternatives 1 and 2), BIO-2a (Alternative 1), BIO-16a (Alternatives 1, 2, and 3),** and **BIO 16b (Alternatives 1, 2, and 3)**

Significance after Mitigation

Less than significant.

Impact BIO-16: Effects on federally protected wetlands.

Aquatic habitats and wetland communities in the Study Area are described in *Section 3.4.1*. Several of these habitats support wetlands and waters that are likely to be regulated by the USACE and the U.S. Environmental Protection Agency (USEPA) under Section 404 the CWA. The San Joaquin River in the Study Area is considered Traditional Navigable Waters (TNW) of the U.S. Other wetlands and waters with a "significant nexus" to the San Joaquin River would also be considered jurisdictional waters of the U.S. Drainages excavated wholly in uplands and draining only uplands are not likely to be jurisdictional features. Wetland within the Modesto WTP spray fields, if any, are also not likely to be considered jurisdictional because they are part of a permitted National Pollution Discharge Elimination System (NPDES).

Based on preliminary site reconnaissance, features within and adjacent to the Study Area that are likely to be considered jurisdictional waters of the U.S. include: natural drainages to the east and west of the San Joaquin River, the Harding Drain, and the alkali pool and swale (Horizon2014b). Some large irrigations ditches with a significant nexus to the San Joaquin River may also be considered waters of the U.S. A jurisdictional wetland delineation will be conducted to evaluate each drainage on a case-by-case basis. The delineation will be submitted to USACE for verification.

Combined Alignment Alternative

Potential adverse impacts to federally protected wetlands would be minimized by using trenchless construction techniques in these areas. However, the precise pipeline alignment and construction methods are not known at this time. Impacts to federally protected wetlands may result from excavation, placement of fill, frac-out, sedimentation, or alteration in drainage patterns. These impacts are considered potentially significant.

Several mitigation measures are proposed to avoid, reduce, or compensate for potential impacts. **Mitigation Measure BIO-16a** would avoid impacts to federally protected wetlands to the extent feasible

and where disturbance of wetlands is unavoidable, require a SWPPP and restoration of impacted areas to pre-construction conditions. **Mitigation Measure BIO-16b** would require compensatory mitigation consistent with the conditions of a CWA Nationwide Permit (NWP) and/or the Final Rule on Compensatory Mitigation for Losses of Aquatic Resources (Compensatory Mitigation Rule) (73 C.F.R. 19594). Mitigation applied under the conditions of a NWP and/or the Compensatory Mitigation Rule would provide sufficient compensation for losses of aquatic resources such that impacts would be less than significant under CEQA and NEPA. Finally, **Mitigation Measure BIO-1d** would be implemented to reduce impacts in the event of a frac-out. With implementation of these mitigation measures, impacts would be less than significant.

Separate Alignment Alternative

Potential impacts to federally protected wetlands would be similar to the Combined Alignment Alternative, but there would be a greater chance for impacts in riparian areas because there would be two crossings of the San Joaquin River. There would be no potential impacts to alkali pool/swale and the natural drainage on the east side of the river because the route for this alternative does not cross that area.

Mitigation Measure BIO-16a, Mitigation Measure BIO-16b, and Mitigation Measure BIO-1d would be implemented as described for the Separate Alignment Alternative. With implementation of these mitigation measures, impacts would be less than significant.

PID Conveyance Alternative

This alternative would result in permanent fill of riparian habitat and perennial stream habitat in the San Joaquin River. The San Joaquin River is a water of the U.S. and is therefore under the jurisdiction of the U.S. Army Corps of Engineers. The expansion of the intake would require a 404 Permit from the Corps and would require entering in to a Streambed Alteration Agreement with the CDFW as required under Section 1601 of the State Fish and Game Code. Impacts would be significant.

Mitigation Measure BIO-16a and **Mitigation Measure BIO-16b** would reduce impacts to less than significant.

No Action Alternative

Under the No Action Alternative, no new pipeline or pump station construction and operation would occur. Therefore, no impacts to sensitive natural communities would occur.

Significance Determination before Mitigation

Potentially significant for all action alternatives.

Mitigation Measures

See **Mitigation Measure BIO-1d (Alternatives 1 and 2).**

Mitigation Measure BIO-16a: Avoid and Minimize Impacts to Federally Protect Wetlands (Alternatives 1, 2 and 3)

To the extent feasible, project-related activities shall avoid federally protected wetlands. To the extent feasible, the proposed project shall minimize potential impacts to federally protected wetlands by utilizing trenchless construction techniques. A SWPPP shall be implemented to reduce the potential for sediments and contaminants to enter wetlands and waters. After construction, surface topography and drainage shall be restored to pre-construction conditions. Where appropriate, revegetation shall be implemented with site-adapted native species.

Mitigation Measure BIO-16b: Obtain Regulatory Permits for Work Activities Taking Place in Wetlands and Waters of the United States and the State (Alternatives 1, 2 and 3)

Work within areas defined as waters of the U.S. that includes placement of fill will require a CWA Section 404 permit and Section 401 Water Quality Certification. All work proposed in jurisdictional

waters of the U.S. shall be authorized under these permits, and the work shall comply with the general and regional conditions of the permits. In areas where disturbance to jurisdictional waters or wetlands occurs, the Partner Agencies shall implement mitigation consistent with the terms of a CWA Nationwide Permit and/or the Final Rule on Compensatory Mitigation for Losses of Aquatic Resources (73 C.F.R. 19594). Compensatory mitigation may include creation, re-establishment, or enhancement of wetlands in the Project Area or at an off-site location. Compensatory mitigation may also include purchase of credits at an approved mitigation bank or contribution to an approved in-lieu fee program.

Significance after Mitigation

Less than significant.

Impact BIO-17: Effects on movement of fish and wildlife and use of breeding sites.

As described in *Section 3.4.1*, several fish and wildlife species utilize the San Joaquin River and adjacent riparian habitat as breeding sites and a migration corridor. The majority of the project would be constructed in agricultural lands, road shoulders, or other disturbed and previously developed lands that do not function as a significant movement corridor for fish and wildlife. Some wildlife breeding does occur in agricultural lands, natural drainages, and other wetlands.

Combined Alignment Alternative

Potential adverse impacts to breeding or movement of fish and wildlife would be minimized by using trenchless construction techniques for crossing the San Joaquin River. Impacts to breeding wildlife would be minimized by conducting pre-construction surveys during the breeding season (See **Mitigation Measures BIO-6, 8, 9, 10, 12 and 13**). Open-cut construction would create temporary barriers to wildlife movement in agricultural lands and ruderal habitat. Impacts of open-cuts on wildlife movement would be minimized by implementation of **Mitigation Measure TR-2**, which requires that trenches be covered at the end of each work day. Some mature trees which provide suitable nesting habitat for raptors may be removed during construction, but outside of the raptor nesting season. Impacts of tree removal would be mitigated by replanting trees (See **Mitigation Measures BIO-12)**. This alternative would not create any permanent barriers to wildlife movement or permanently disrupt breeding sites. Thus, impacts would be less than significant.

Separate Alignment Alternative

Potential impacts would be similar to the Combined Alignment Alternative, but there would be two crossings of the San Joaquin River, and thus a greater chance for distractions, noise, and temporary displacement in higher quality breeding areas. This alternative would also temporarily impact a larger area of agricultural lands that may be used for movement or nesting. Impacts to breeding wildlife would be minimized by conducting pre-construction surveys during the breeding season (See **Mitigation Measures BIO-6, 8, 9, 10, 12 and 13**). Impacts to wildlife movement would be minimized by implementing **Mitigation Measure TR-2**. This alternative would not create any permanent barriers to wildlife movement or permanently disrupt breeding sites. Thus, impacts would be less than significant.

PID Conveyance Alternative

Potential impacts would be similar to the Combined Alignment Alternative, but there would be construction within the San Joaquin River, and thus a greater chance for distractions, noise, and temporary displacement in higher quality breeding areas, including effects on freshwater fish that use the San Joaquin River as a migratory corridor. Impacts to migratory fish, including salmonids would be minimized by measures to minimize impacts of in-river construction (see **Mitigation Measure BIO-4b**). Impacts to breeding wildlife would be minimized by conducting pre-construction surveys during the breeding season (See **Mitigation Measures BIO-6, 8, 9, 10, 12 and 13**). Impacts to wildlife movement would be minimized by implementing **Mitigation Measure TR-2**. This alternative would not create any

permanent barriers to fish or wildlife movement or permanently disrupt breeding sites. Thus, impacts would be less than significant.

No Action Alternative

Under the No Action Alternative, no new pipeline or pump station construction and operation would occur. Therefore, no impacts to breeding or movement of fish and wildlife.

Significance Determination before Mitigation

Potentially significant for all action alternatives.

Mitigation Measures

See **Mitigation Measures BIO-6, 8, 9, 10, 12 and 13**, and **TR-2 (Alternatives 1, 2 and 3); and Mitigation Measure BIO-4b (Alternative 3).**

Significance after Mitigation

Less than significant.

Impact BIO-18: Conflict with local ordinances or policies protecting biological resources.

As discussed in *Section 3.4.2*, the Stanislaus County General Plan establishes several policies to protect sensitive species and habitats such as vernal pools, riparian habitats, and oak woodlands. There is also a policy (Policy Twenty-nine) which indicates the County should continue to lobby the Federal Government to provide adequate water flows in the County's rivers to allow salmon migration.

Combined Alignment Alternative

Potential conflicts with County policies that protect sensitive plants, wildlife and habitats would be minimized by using trenchless construction techniques and avoiding open-cut construction in sensitive habitats. However, the precise plan for use of various construction methods is not known and potential impacts to areas that potentially support sensitive wildlife and plant life may result from sedimentation, or alteration in drainage patterns within suitable habitat. These impacts would be considered potentially significant. Implementation of **Mitigation Measures BIO-1d, BIO-2a, and BIO-16a** would reduce impacts to a level that is less than significant.

Separate Alignment Alternative

Potential conflicts with local ordinances or policies would be similar to the Combined Alignment Alternative, but there would be a greater chance for impacts in riparian areas because there would be two crossings of the San Joaquin River. There would be no potential impacts to sensitive habitats between Stations 553+00 to 563+00 (**Figure 3.4-1**, Sheet 9) because the route for this alternative does not cross that area. Implementation of **Mitigation Measures BIO-1d and BIO-16a** would reduce impacts to a level that is less than significant.

PID Conveyance Alternative

Potential conflicts with local ordinances or policies would be similar to the combined alignment alternative, but there would be a greater chance for impacts in riparian areas because there would be construction within the San Joaquin River. Implementation of **Mitigation Measures BIO-4b and BIO-16a** would reduce impacts to a level that is less than significant.

No Action Alternative

Under the No Action Alternative, no new pipeline or pump station construction and operation would occur. Therefore, no conflicts to local ordinances or policies would occur.

Significance Determination before Mitigation

Potentially significant for all action alternatives.

Mitigation Measures

See **Mitigation Measures BIO-1d (Alternatives 1 and 2), 2a (Alternative 1), 4b (Alternative 3), and 16a (Alternatives 1, 2 and 3).**

Significance after Mitigation

Less than significant with mitigation.

Impact BIO-19: Effects on existing Habitat Conservation Plan (HCP).

Combined and Separate Alignment Alternatives, PID Conveyance Alternative

The PG&E San Joaquin Valley Operation & Maintenance Habitat Conservation Plan (PG&E O&M HCP) (PG&E 2006) covers specific PG&E activities throughout nine counties in the San Joaquin Valley, including Stanislaus County. The PG&E O&M HCP complies with the federal and state ESA and addresses multiple species and critical habitats. The PG&E O&M HCP outlines steps on minimizing, avoiding, and compensating for possible direct, indirect, and cumulative adverse effects on threatened and endangered species that could result from PG&E operation and maintenance activities in the San Joaquin Valley. The proposed project lies within the PG&E O&M HCP boundaries. The project is not a covered activity under the PG&E O&M HCP.

Plant species covered by the PG&E O&M HCP with the potential to be affected by the proposed project include: lesser saltscale, slough thistle Delta button-celery and Hispid bird's-beak. Wildlife covered by the PG&E O&M HCP with the potential to be affected by the proposed project include: vernal pool fairy shrimp, vernal pool tadpole shrimp, valley elderberry longhorn beetle, giant garter snake, Swainson's hawk, white-tailed kite, tricolored blackbird, and western burrowing owl. The proposed project would not conflict with the HCP's conservation strategy for these species. There may be some overlap with the proposed project and PG&E's San Joaquin Valley O&M activities, but this would mostly occur in developed or disturbed areas. Therefore, impacts are considered to be less than significant.

No Action Alternative

Under the No Action Alternative, no new pipeline or pump station construction and operation would occur. Therefore, no impacts to HCP would occur.

Significance Determination before Mitigation

Less than significant for all action alternatives.

Impact BIO-CUM-1: Effects on terrestrial vegetation, wildlife, and sensitive communities.

Less than 70 years ago, large portions of the Study Area supported a diverse assemblage of native plants and wildlife. This is inferred from historical topographic maps (USGS 1952), CNDDB records in the Study Area (CDFW 2014), and descriptions of historical habitat conditions along the San Joaquin River corridor (JSA 1998, FWUA and NRDC 2002). Anthropogenic activity, especially conversion to farmland and developed land use, and development of transportation infrastructure such as Interstate 5 has substantially changed wildlife populations and vegetation communities in the Study Area. Additionally, construction and operation of the CVP and SWP, and the introduction of nonnative plant and animal species have resulted in overall significant adverse effects on the extent, species composition, and functioning of wetlands, riparian habitats, and other sensitive natural communities and the distribution and abundance of wildlife species. The threatened and endangered status of numerous plant and animal species, and the dramatic reductions in the extent of wetland and riparian vegetation are evidence of these overall significant cumulative impacts.

Special-status species with the potential to occur in the Study Area are listed in **Tables 3.4-1 and 3.4-2**. The population status and/or viability vary for each of these species. Declines in plant and wildlife populations are largely due to long-term degradation of environmental conditions, as described above.

With few exceptions, the declines in the population of a species are the result of the synergistic effects of anthropogenic activities, and not a single causative agent or project. Thus, by definition, it is cumulative impacts that threaten the viability of these species. Non-project related activities that may impact these species either through direct disturbance or habitat alteration include, but are not limited to: agriculture, climate change, competition with nonnative species, recreational activities, streambed alteration, water resources management, urbanization, and wildfire management.

As mentioned previously, the vast majority of the project would be constructed in agricultural lands, road shoulders, or other disturbed and previously developed lands. In general, these areas do not support rare species. Furthermore, potential adverse impacts to special-status species would be minimized by using trenchless construction techniques and avoiding open-cut construction in sensitive habitats. Mitigation **Measures BIO-1 through BIO-13** would further minimize potential impacts. It is highly unlikely that the proposed project would contribute substantially to any foreseeable decline of any special-status plant or wildlife species. Therefore, the incremental contribution of the proposed project would not be cumulatively considerable, and is considered less than significant.

Similarly, the proposed project would avoid or have only minor impacts to sensitive natural community and federally protected wetlands. **Mitigation Measures BIO-16** would further minimize potential impacts. With these avoid and mitigation measures, the proposed project is not likely to result in substantial loss or degradation of habitats or have significant adverse effects on vegetation and wildlife. This conclusion is based on field surveys of the Study Area and the known distribution of these organisms and their habitats in relationship to anticipated actions under the proposed project. Thus, the incremental contribution of the proposed project would not be cumulatively considerable.

Significance Determination before Mitigation

Less than significant for both alternatives.

Impact BIO-CUM-2: Effects on fish species and their habitats.

The fish assemblage and habitats of the San Joaquin River have been severely modified and degraded by upstream impoundments, reductions in instream flows, degradation of spawning and juvenile rearing habitat, increased occurrence of invasive aquatic vegetation and non-native predatory fish, unscreened water diversions, reduction of floodplain, armoring of streambanks, water quality degradation including exposure to elevated spring and summer water temperatures, dissolved oxygen depression in the Stockton Deep Water Shipping Channel, agricultural return flows, among other stressors. Under the baseline condition without the proposed project, the impacts are already cumulatively substantial.

The cumulative impacts that have occurred on the San Joaquin River and its tributaries have raised significant concerns with resource management agencies (e.g., NMFS, CDFW, SWRCB). The San Joaquin River supports anadromous steelhead, which are listed as threatened under the federal ESA. The river is part of the Central Valley recovery plan for salmonids (NMFS 2014), is Essential Fish Habitat for Chinook salmon, and the subject of ongoing restoration efforts to reintroduce spring-run and fall-run Chinook salmon downstream of Friant Dam.

The proposed project would contribute a very small increment of reduced flows in the river that would contribute a small incremental addition to the already cumulatively substantial impacts and could therefore contribute to further degradation to habitat and potentially fish survival. Existing combined discharges from Modesto and Turlock average 25 cfs, and range from a low of 12.9 cfs in June and July when Modesto does not discharge to the river, to a high of 51.4 cfs in February when both cities are discharging (**Appendix E**). As noted in the discussion of **Impact BIO-5** above, the magnitude of predicted changes in juvenile salmon survival, adult escapement, and habitat conditions in the lower river and estuary would be well within the natural observed variation (also see **Appendix E**). Redirection of the discharge of treated wastewater from the WWTPs at Modesto and Turlock away from the San Joaquin

River would not be expected to result in a measureable effect on the population dynamics of Chinook salmon, or on other fish in the San Joaquin River.

Previous studies have shown a relationship between flow in the San Joaquin River in the spring (March to May) and survival of juvenile salmon, as well as adult salmon escapement 2.5 years later (San Joaquin River Group Authority 2007). Effects of the reduction in discharge were thus estimated by evaluating the potential change in flows from March to May (see **Appendix E** for additional details). Reductions in flows were calculated and input into salmon survival models to predict how changes in flows might affect salmon survival and abundance. Reductions in flows would represent an estimated change in water surface ranging from about 0.25 to 1 inch, which represents a change of 0.8% or less and is not expected to represent a biologically meaningful reduction in wetted area of the river channel.

Although the project represents a minor reduction in flows, removal of the discharges to the river would also remove nutrients and salinity, which would improve water quality, and thereby improve fisheries habitat. Removal of discharges would remove 700 tons of nitrate (as nitrogen) and 9,300 tons of sodium from the river annually (Reclamation 2013). This reduction in nutrient and salt loading would be beneficial.

Nevertheless, based on the current poor conditions for fish in the river and the sensitivity to further impacts to salmonids, the contribution of the proposed project could potentially be considered cumulatively considerable, even though the incremental change is not expected to be measurable. To address the potential for cumulative effects on salmonids in the San Joaquin River, the Project Partners would work with resource agencies, including NMFS, USFWS, and CDFW to assist in implementation of one or more of the recovery actions that have been identified in the Recovery Plan for Central Valley Chinook Salmon and Steelhead, which have been incorporated in **Mitigation Measure BIOCUM-1**. This measure would reduce cumulative impacts to less than significant.

The No Action Alternative could also have long-term cumulative impacts on the San Joaquin River. With continued discharge of treated wastewater, nutrients and salts would continue to be discharged, and as flows increase over time, the loadings of both nutrients and salts would increase. Although it is possible that additional treatment requirements for removal of nutrients and salts may be imposed, it not possible to predict what future pollutant loadings would be. However, continued discharge of treated wastewater would result in higher loadings than redirection of the flows for use as recycled water.

Significance Determination before Mitigation

Potentially significant for both alternatives. Potentially significant for No Action Alternative.

Mitigation Measures

Mitigation Measure BIOCUM-1: Assistance with Salmonid Recovery Plan Actions (Alternatives 1, 2 and 3)

The NVRRWP Project Partners would work with Reclamation and with resource agencies, including NMFS, USFWS, and CDFW to assist in implementation the following recovery actions from the Recovery Plan for Central Valley Chinook Salmon and Steelhead.

- *Implement projects that improve wastewater treatment in the San Joaquin River watershed*. The NVRRWP as designed would reduce the input of nutrients and salinity to the San Joaquin River, and as such the proposed project already addresses this recovery action.
- *Develop and implement a spawning gravel augmentation plan in the San Joaquin River.* The NVRRWP Project Partners would make a cash contribution to an existing restoration program or organization working to augment spawning gravels. The funding could assist in programs being implemented as part of Reclamation's San Joaquin River Restoration Program, the USFWS Anadromous Fish Restoration Program, or other relevant restoration program

Significance after Mitigation

Less than significant for Alternatives 1 and 2.

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3.5 Cultural Resources

This section evaluates the potential impacts on cultural resources associated with implementation of the proposed project. The description of the cultural resources setting is based on findings of the Historic Property Survey Report (HPSR) prepared by Basin Research (2014). Impacts of the NVRRWP impacts on cultural resources are also provided in this section.

3.5.1 Environmental Setting/Affected Environment

This section evaluates the environmental setting for prehistoric, historic, and ethnological resources. The HPSR, forms the basis for this section.

Regional Setting

Prehistoric

Cultural resources are traces of human occupation and activity. Native American occupation sites appear to have been selected for accessibility, protection from seasonal flooding, and the availability of resources. Archaeological sites include lithic and ground stone scatters, bedrock milling stations, house pits (abandoned villages sites), cemeteries and village habitations.

The San Joaquin Valley has been characterized as ". . . one of the least-known archaeological areas in California" although the archaeological research to date does "... indicate that populations expanded and settlements proliferated after circa A.D. 1500 in the southern and western portions of the San Joaquin Valley." The lower San Joaquin Valley provided a favorable environment for Native Americans despite the periodic flooding of the bottomlands, intense summer heat, and the ever-present annoyance of mosquitoes. In general, archaeological research has indicated that prehistoric archaeological resources tended to be located on benches and terraced areas adjacent to major drainages and springs with the majority of recorded sites clustering around potable water sources. (Basin Research 2014)

Native American occupation and use of the general area appears to extend over 5000-7000 years and may be longer. Archaeological information suggests an increase in the prehistoric population over time due to more efficient resource procurement, storage and increasing political complexity. A tentative chronological sequence of four cultural complexes has been proposed for the general area: the Positas (ca. 3300-2600 B.C.), the Pacheco (ca. 2600 B.C.-A.D. 300), the Gonzaga (ca. A.D. 300-100); and, the Panoche (ca. A.D. 1500-1850) (Basin Research 2014).

Ethnographic

The project on the west side of the San Joaquin River was within the territory of the Northern Valley Yokuts. Little is known of the aboriginal inhabitants of the lower or northern San Joaquin Valley as a result of introduced diseases, missionization and displacement by gold seekers. The Yokuts may have been fairly recent arrivals in the San Joaquin Valley. Settlements appear to have focused along the water courses of the San Joaquin Valley. The Yokuts were semi-sedentary and relied heavily on riverine resources and their abundance of fish and waterfowl. The Yokuts first came into contact with Europeans in the late 1700s and were affected by missions. Mission San Jose (present-day Fremont), Mission Santa Clara, and Mission San Juan Bautista appear to have had the most impact on the Yokuts. (Basin Research 2014)

Historic

The history of the San Joaquin Valley is divided into the Age of Exploration, the Hispanic Period (Spanish Period 1769-1821 and the Mexican Period 1822-1848), and the American Period (1848-onward). During the Hispanic Period, Spanish government policy in northwestern New Spain was directed at the founding of presidios (forts), missions and pueblos (secular towns) with the land held by

the Crown whereas later Mexican policy (1822-1848) stressed individual ownership of the land with grants of vast tracts of land to individuals. The American Period focused on development and growth - a pattern that continues into the 21st Century. The American period covered the creation of Stanislaus County, the development of agriculture and transportation in the NVRRWP study area, the colony system, which was responsible for the settling San Joaquin Valley, and the passage of the Wright act in 1887 that permitted groups of farmers to form irrigation districts with the authority to divert river water to dry land for flood control and water conservation.

Project Vicinity

Archaeological Resources Setting

For the purpose of evaluating the possible presence of resources that could be affected by the proposed project, an Area of Potential Effect (APE) was defined, which encompasses the area that could be disturbed by construction of project facilities. No prehistoric or combined prehistoric/historic era sites have been recorded or reported within or adjacent to the APE based on a review of 25 cultural resource compliance reports on file with the California Historical Resources Information System- Central California Information Center (CHRIS/CCIC)[1]. In addition, no Historic Period archaeological sites have been recorded or reported in or adjacent to the APE. The field inventory confirmed that there is no evidence of the presence of cultural resources in the project area.

Historic Resources Setting

No known Hispanic Period expeditions, adobe dwellings, other structures, or features have been reported in or adjacent to the APE.

Four Historic American Period sites have been recorded within the APE or are within 0.25 miles:

- Two recorded linear historic period sites are within the APE along the proposed alignment:
  - P-50-000001/CA-STA-350H - the Southern Pacific Railroad (Tracy Branch) (crossed by Alternatives 1 and 2)
  - P-50-001904, the Delta-Mendota Canal (at the western terminus of Alternatives 1 and 2)
- Two recorded historic period sites have been recorded within 0.25 miles of the APE:
  - P-50-001882 - a dairy barn and associated milk house located at 2006 Lemon Avenue just east of Elm Avenue is adjacent to the APE (Alternatives 1 and 2).
  - P-50-002043 - former Crows Landing Naval Auxiliary Air Station is recorded to the south of W. Marshall Road (Alternative 2)

Local or state historically or architecturally significant structures, landmarks, or points of interest have been identified within or adjacent to the project as follows:

The APE ends at the Delta-Mendota Canal (DMC). The DMC has been evaluated individually as eligible for inclusion on the NRHP under Criterion A (Basom Research 2014). The Central Valley Project, Delta-Mendota Canal (P-50-001904 in Stanislaus County) is listed on the Stanislaus County HPD as code 2S2 (i.e., determined eligible for separate listing by a consensus determination) under criteria A and C.

The former alignment of the San Pablo and Tulare Extension Railroad Company (SP&T) (now used by the California Northern Railroad Company [CFNR]) with an inferred period of significance of 1887-1889 has been evaluated as not eligible for inclusion on the NRHP but appears to be locally significant under NRHP Criterion A due to ". . . its association with the settlement and town founding in the west side of the San Joaquin Valley". (Basin Research 2014)

No potentially significant architectural resources were observed.

[1] The compliance reports do not cover the entire proposed APE.

Ethnographic Resources Setting

No known ethnographic, traditional or contemporary Native American use areas and/or other features of cultural significance have been identified in or adjacent to the APE based on research and a search of the Native American Heritage Commission (NAHC) Sacred Lands Inventory. Consultation with six Native American individuals/groups recommended by the NAHC did not result in any information about the APE or adjacent areas. No prehistoric or historic period archaeological materials were observed within the APE during the field inventory.

Paleontological Resources

As described in *Section 3.8, Geology and Soils*, there are three orders of soils represented within the project area, including Alfisols, Inceptisols, and Mollisols. Alfisols are typically found in semiarid to moist areas and are a result of weathering processes that leach clay minerals and other constituents out of the surface layer and into the subsoil. Inceptisols are found in semiarid to humid environments. These soils generally exhibit only moderate degrees of soil weathering and development that display a weak but noticeable soil profile. Mollisols are typically found in temperate grasslands at mid-latitudes. This soil type is characterized by a dark, organic-rich surface horizon. These soils in the San Joaquin Valley have been disturbed through decades of farming, and are not likely to contain paleontological resources. The proposed pipeline alignment would occur mainly through road rights-of-way, which have been disturbed for road construction and utilities installation and as such would not be expected to contain any paleontological resources.

3.5.2 Regulatory Framework

This section describes laws and regulations at the state and local level that may apply to the project. There are no federal regulations that apply to the project.

Federal Policies and Regulations

Section 106 of the National Historic Preservation Act of 1966 (Section 106)

Section 106 of the National Historic Preservation of 1966 (NHPA) and its implementing regulations 36 CFR Part 800 require a federal agency with jurisdiction over a federal, federally assisted or federally licensed undertaking to take into account the effect of the undertaking on properties listed on or eligible for the National Register of Historic Places (National Register) and prior to approval of an undertaking to afford the Advisory Council on Historic Preservation an opportunity to comment on the undertaking.

State Policies and Regulations

California Register of Historic Resources

"Historical resource" is a resource listed in or determined to be eligible for listing in the California Register of Historical Resources (CRHR). The CRHR includes resources listed in or formally determined eligible for listing in the National Register of Historic Places (NRHP) as well as some California State Landmarks and Points of Historical Interest (Public Resources Code [PRC], Section 21084.1 and CEQA Guidelines, Section 15064.5 [a], [b]).

A "Unique Archaeological Resource" means an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

(1) Contains information need to answer important scientific research questions and that there is a demonstrable public interest in that information.

(2) Has a special and particular quality such as being the oldest of its type or the best available example of its type.

(3) Is directly associated with a scientifically recognized important prehistoric or historic event or person. (Public Resources Code, Section 21083.2].

Properties of local significance that have been designated under a local preservation ordinance (e.g., local landmarks or landmark districts) or that have been identified in a local resources inventory may be eligible for listing in the CRHR and are presumed to be "historical resources" for purposes of CEQA (Public Resources Code, Section 5024.1 and California Code of Regulations, Title 14, Section 4850). A Lead Agency should consider a locally significant resource potentially eligible for the CRHR unless it has been demolished, lost substantial integrity, or there is other significant evidence indicating that it is not eligible for listing.

Lead agencies must evaluate any listed or potential cultural resources in accordance with the criteria of the CRHR. The CRHR (Public Resources Code Section 5024.1) is a listing of properties that are to be protected from substantial adverse change, and it includes properties that are listed, or have been formally determined to be eligible for listing in the NRHP, State Historical Landmarks, and eligible Points of Historical Interest. A historical resource may be listed in the CRHR if it meets one or more of the following criteria:

(1) It is associated with events that have made a significant contribution to the broad patterns of local or regional history, or cultural heritage of California or the United States;

(2) It is associated with lives of persons important in our past;

(3) It embodies distinctive characteristics of a type, period, or method of construction, or represents the work of a master or possesses high artistic values; or

(4) It has yielded or has the potential to yield information important in the prehistory or history of the local area, California, or the nation.

A resource that is not listed in or determined to be eligible for listing in the CRHR, not included in local register or historic resources, or not deemed significant in a historical resource survey may nonetheless be historically significant. This provision is intended to give a Lead Agency discretion to determine that a resource of historic significance exists where none had been identified before and to apply the requirements of Public Resources Code Section 21084.1 to properties that have not previously been formally recognized as historic.

California Environmental Quality Act

CEQA requires a Lead Agency to determine if a project will have a significant effect on the environment and to assess possible impacts. In terms of cultural resources, a project is considered to have a significant effect if it would disrupt or adversely affect one or more properties of historic or cultural significance to the community (Public Resources Code, Section 21084.1 and CEQA Guidelines). Section 21083.2 also requires agencies to determine whether proposed projects would have an effect on "unique archaeological resources" (see definition of "unique archaeological resources" above).

Local Policies and Regulations

Stanislaus County

Stanislaus County has identified the following goals and policies in the Conservation Element of the General Plan (1994):

GOAL EIGHT*:* Preserve areas of national, state, regional and local historical importance

> Policy Twenty-four: The County will support the preservation of Stanislaus County's cultural legacy of historical and archeological resources for future generations.

City of Modesto

The following policies in the City of Modesto Urban Area General Plan (City of Modesto 2008) are applicable to the project:

> *Archaeological and Cultural Resources Policies (i):* Any project subject to CEQA that involves substantial earth-disturbing activities, where excavation/construction would occur outside of areas where previous development has occurred, or where excavation/construction would occur at depths greater than existing foundations, roads, and/or trenches in the immediate vicinity, shall require evaluation of the site by a qualified archaeologist retained by the project applicant, which would include at minimum a records search, a Phase I pedestrian survey, and preparation of an archaeological report containing the results of this cultural resources inventory identification effort for submittal to the Central California Information Center.
>
> *Archaeological and Cultural Resources Policies (j):* If Phase II archaeological evaluations are recommended, a report of all such surveys and excavations with recommendations shall be completed prior to project approval.
>
> *Archaeological and Cultural Resources Policies (k):* Any project subject to CEQA that involves substantial earth-disturbing activities shall require consultation by the applicant for the purposes of determining archaeological and cultural resources impacts and creating appropriate mitigation to address such impacts.

3.5.3 Impact Analysis/Environmental Consequences

Methodology for Analysis

This analysis evaluates anticipated changes in the physical environment resulting from the proposed project against the thresholds of significance identified below, to determine if direct and indirect changes from existing conditions would constitute potentially significant effects. Project changes are described and potential impacts, if any, are identified under each impact discussion. Where impacts would be considered potentially significant, mitigation measures are identified to reduce impacts to a less-than-significant level.

The inventory of cultural resources was performed by qualified archaeologists and historical resources specialists with Basin Research. Basin Research did an extensive review of background information, starting with a pre-field identification effort that included the following:

- A prehistoric and historic site record and literature search and review. The search included coverage for ¼ mile radius of the study area conducted by the CHRIS-CCIC;
- review of literature (e.g., selected anthropological and historical publications and other documents) and maps on file at selected libraries and repositories;
- communication with interested parties including the NAHC and interested Native Americans;
- Review of the shipwreck database search results through the California State Lands Commission (CSLC). The search provides information regarding the presence/absence of shipwrecks around the river crossings; and
- A pedestrian survey.

This inventory was used as the basis of the assessment of potential impacts presented below.

Thresholds of Significance

Consistent with Appendix G of the *CEQA Guidelines* an impact on cultural resources would be considered significant if the project would:

- Cause a substantial adverse change in the significance of a unique archaeological resource pursuant to §15064.5;
- Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5;
- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature; or
- Disturb any human remains, including those interred outside of formal cemeteries.

A project with an effect that may cause a substantial adverse change in the significance of a cultural resource is a project that may have a significant effect on the environment. Substantial adverse change in the significance of a cultural resource means physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of the resource would be materially impaired (CEQA Guidelines Section 15064.5). The significance of a cultural resource is materially impaired when a project:

- Demolishes or materially alters in an adverse manner those physical characteristics of a cultural resource that convey its historical significance and that justify its inclusion in, or eligibility for, inclusion in the CRHR; or,
- Demolishes or materially alters in an adverse manner those physical characteristics that account for its inclusion in a local register of cultural resources pursuant to section PRC 5020.1(k) or its identification in a cultural resources survey meeting the requirements of PRC 5024.1(g), unless the public agency reviewing the effects of the project establishes by a preponderance of evidence that the resource is not historically or culturally significant; or
- Demolishes or materially alters in an adverse manner those physical characteristics of a cultural resource that convey its historical significance and that justify its eligibility for inclusion in the CRHR as determined by a lead agency for purposes of CEQA.

Impacts and Mitigation Measures

Impact CUL-1 Cause a substantial adverse change in the significance of a unique archaeological resource pursuant to §15064.5 or disturb any human remains, including those interred outside of formal cemeteries.

Combined Alignment Alternative

Based on a review of relevant research and consultation, and the results of a pedestrian survey, it was determined that no prehistoric or combined prehistoric/historic era sites or historic period archaeological sites have been recorded or reported within or adjacent to the APE.

As described above, the San Joaquin Valley is one of the least-known archaeological areas in California, and the potential for significant subsurface prehistoric archaeological resources within the project is considered low based on the review of the archival archaeological data and the development of an archaeological sensitivity map. However, excavation and digging associated with construction activities could potentially disturb unknown archaeological sites or result in the inadvertent exposure of buried prehistoric or protohistoric (ethnographic) Native American human remains during construction activities. If encountered, construction activities could inadvertently damage these resources. **Mitigation Measures CUL-1** and **CUL-2** would reduce potential impacts associated with discovery of these resources to a less than significant level.

Separate Alignment Alternative

Impacts would be the same as the Combined Alignment Alternative.

PID Conveyance Alternative

Based information for the overall project area, it is expected that the potential for significant subsurface prehistoric archaeological resources within the project is low. The area of the PID intake has a moderate sensitivity because of its location on the San Joaquin River, but a survey of the site uncovered no archaeological material (PID 2006). Impacts would be similar to Alternatives 1 and 2, and excavation and digging associated with construction activities could potentially disturb unknown archaeological sites or result in the inadvertent exposure of buried prehistoric or protohistoric (ethnographic) Native American human remains during construction activities. If encountered, construction activities could inadvertently damage these resources. **Mitigation Measures CUL-1** and **CUL-2** would reduce potential impacts associated with discovery of these resources to a less than significant level.

No Action Alternative

If no action were taken, there would be no cultural resources-related impacts within the study area.

Significance Determination

Potentially significant for all action alternatives.

Mitigation Measures

Mitigation Measure CUL-1: Discovery of previously unknown archaeological resources during construction (Alternatives 1, 2 and 3)

The following measures shall be implemented in the event of unexpected discovery of archaeological resources:

- The project proponent shall note on any construction plans that require ground disturbing excavation that there is a potential for exposing buried cultural resources.
- The Partner Agencies shall retain a Professional Archaeologist to provide a pre-construction briefing to supervisory personnel of any excavation contractor to alert them to the possibility of exposing significant prehistoric archaeological resources within the study area. The briefing shall discuss any archaeological objects that could be exposed, the need to stop excavation at the discovery, and the procedures to follow regarding discovery protection and notification of the project proponent and archaeological team.
- The project proponent shall retain a Professional Archaeologist on an "on-call" basis during ground disturbing construction for the project to review, identify and evaluate cultural resources that may be inadvertently exposed during construction. The archaeologist shall review and evaluate any discoveries to determine if they are historical resource(s) and/or unique archaeological resources under CEQA.
- If cultural resources are encountered during the project, construction personnel shall avoid altering these materials and their context until a Professional Archaeologist has evaluated the situation. Project personnel shall not collect or retain cultural resources. Prehistoric resources include, but are not limited to, chert or obsidian flakes, projectile points, mortars, and pestles; and dark, friable soil containing shell and bone, dietary debris, heat-affected rock, or human burials. Historical resources include stone or adobe foundations or walls, structures and remains with square nails, and refuse deposits, often in old wells and privies.
- If the Professional Archaeologist determines that any cultural resources exposed during construction constitute a historical resource and/or unique archaeological resource, he/she shall notify the Partner Agencies and other appropriate parties of the evaluation and recommended measures to mitigate effects to a less-than significant impact. Mitigation measures may include avoidance, preservation in-place, recordation, additional

archaeological testing and data recovery, among other options. Treatment of any significant cultural resources shall be undertaken with the approval of the U.S. Bureau of Reclamation and other lead agencies.

- Any identified cultural resources shall be recorded on forms DPR 422 (archaeological sites) and/or DPR 523 (historic properties) or similar forms by a Professional Archaeologist.

Mitigation Measure CUL-2: Discovery of human burials during construction (Alternatives 1, 2 and 3)

The treatment of human remains and of associated or unassociated funerary objects discovered during any soil-disturbing activity within the project shall comply with applicable State laws. This shall include immediate notification of the Stanislaus County Coroner (Stanislaus County Sherriff's Office).

In the event of the coroner's determination that the human remains are Native American, notification of the NAHC is required. The NAHC shall be afforded the opportunity to appoint a Most Likely Descendant (MLD) (PRC Section 5097.98). The archaeological consultant, project sponsor, and MLD shall make all reasonable efforts to develop an agreement for the treatment, with appropriate dignity, of human remains and associated or unassociated funerary objects (CEQA Guidelines Section 15064.5(d)). The agreement should take into consideration the appropriate excavation, removal, recordation, analysis, custodianship, curation, and final disposition of the human remains and associated or unassociated funerary objects. California Public Resources Code allows 48 hours to reach agreement on these matters. If the MLD and the other parties do not agree on the reburial method, the project will follow PRC Section 5097.98(b) which states that "the landowner or his or her authorized representative shall reinter the human remains and items associated with Native American burials with appropriate dignity on the property in a location not subject to further subsurface disturbance."

Significance Determination after Mitigation

Less than significant.

Impact CUL-2 Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5.

Combined Alignment Alternative

As described above, two recorded linear historic period sites are within the APE: the Southern Pacific Railroad (Tracy Branch), and the DMC. As described in *Chapter 2, Alternatives and Proposed Project/Action*, the proposed Project would avoid the Southern Pacific Railroad through tunneling. The proposed project would construct a terminal weir to facilitate discharge of recycled water into the DMC. The facility would be adjacent to, but outside of the Canal, and is not expected to affect the integrity of the DMC. The design of the discharge structure, which is shown in **Figure 2-8**, is intended to allow construction to be completed without any modifications to the canal, but if there are any effects on the canal during consruction the structure would be restored to its existing condition. As such, the proposed project would not result in any impacts on historic resources.

Excavation and digging associated with construction activities could potentially expose and disturb previously unknown historical resources. Thus, construction operations could result in the inadvertent exposure of historical resources that could be eligible for inclusion on the CRHR (PRC Section 5024.1). Alteration and modification of historic resources could occur and would be considered potentially significant. **Mitigation Measure CUL-1**, described above, would reduce potential impacts to less-than-significant levels.

Separate Alignment Alternative

Impacts would be the same as Combined Alignment Alternative.

PID Conveyance Alternative

Although an APE has not been developed for this alternative, the same two historic resources would be affected by this alternative: the Southern Pacific Railroad and the DMC. Impacts would be the same as the Combined and Separate Alignment Alternatives.

No Action Alternative

If no action were taken, there would be no cultural resources-related impacts within the study area.

Significance Determination before Mitigation

Potentially significant for all action alternatives.

Mitigation Measures

See **Mitigation Measure MM CUL-1** above.

Significance after Mitigation

Less than significant.

Impact CUL-3 Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

Combined Alignment Alternative

The infrastructure improvements under the proposed project would occur in previously disturbed road rights-of-way, or on disturbed land on the Jennings Plant or near the Harding Drain Bypass Pipeline at the southwest corner of the intersection of South Carpenter Avenue and Harding Road. Because these areas have been previously disturbed, soils in these areas are not expected to contain fossils. However, in the unlikely event that fossils are encountered during construction impacts could be potentially significant.

Separate Alignment Alternative

Impacts would be the same as Combined Alignment Alternative.

PID Conveyance Alternative

Similar to the Combined and Separate Alignment Alternatives, in the unlikely event that fossils are encountered during construction impacts could be potentially significant.

No Action Alternative

If no action were taken, there would be no cultural resources-related impacts within the study area.

Significance Determination before Mitigation

Potentially significant for all action alternatives.

Mitigation Measures

Mitigation Measure CUL-3: Discovery of paleontological resources during construction (Alternatives 1, 2 and 3)

If paleontological resources are discovered during earthmoving activities, the construction crew would immediately cease work near the find. In accordance with Society of Vertebrate Paleontology guidelines (Society of Vertebrate Paleontology 2010), a qualified paleontologist would assess the nature and importance of the find and recommend appropriate salvage, treatment, and future monitoring and mitigation.

Significance after Mitigation

Less than significant.

Cumulative Impact Analysis

The geographic scope of potential cumulative impacts related to cultural resources is the study area. There are three relevant projects within the vicinity of the proposed project that may contribute to cumulative impacts:

- Jennings Treatment Plant Phase 2 Upgrades: increase tertiary treatment capacity by 12.6 MGD;
- West Main Improvement Project: widen West Main Ave to 3 lanes from the San Joaquin River to Crows Landing Road (Stanislaus County Department of Public Works 2011);
- StanCOG South Corridor Study: study potential alignments and corridor options for an expressway from the City of Turlock on the east to I-5 on the west (Stanislaus County Department of Public Works 2011).

Construction of the cumulative projects also have the potential to result in the disturbance of previously unknown cultural resources (archaeological and historical) and human burials during excavation activities. However, with the implementation of **Mitigation Measures CUL-1, CUL-2**, and **CUL-3** the project's contribution to these cumulative impacts would not be cumulatively considerable. Thus, the project's contribution to cumulative impacts would be less than cumulatively significant.

3.5.4 References

Society of Vertebrate Paleontology. 2010. Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources.

Stanislaus County. 1994. Stanislaus County General Plan: Chapter 3, Conservation Element. Available at: http://www.stancounty.com/planning/pl/gp/gp-chapter3.pdf.

3.6 Energy Resources

This section presents the physical and regulatory setting for energy resources surrounding the proposed project. The impact analysis determines the potential for construction and operation of the North Valley Regional Recycled Water Program (NVRRWP) to result in impacts related to wasteful, unnecessary, or inefficient use of energy resources.

3.6.1 Environmental Setting/Affected Environment

This section describes the environmental setting for energy resources within the study area, which includes the entire State of California. The sections below summarize energy resources within the state and regional setting.

California Setting

California generates more than 200,000 gigawatt hours (GWh) of electricity every year, transporting that electricity over 32,000 miles of transmission lines throughout the state (California Energy Commission [CEC] 2014a). In 2011, California imported just 30% of the electricity needed from the Pacific Northwest and the U.S. Southwest. Natural gas provides 53% of the in-state electric generation and is the main source for electricity generation within California. In 2010, the California electricity mix included natural gas (53.4 percent), nuclear (15.7%), large hydroelectric plants (14.6%), and coal (1.7 percent). The remaining 14.6 percent was supplied from renewable resources such as wind, solar, geothermal, biomass, and small hydroelectric facilities (CEC 2011). In-state electricity production at large hydroelectric facilities decreased by nearly 37% as compared to 2011, while wind facilities increased output by 31% (CEC 2013a).

The CEC estimates that California's energy consumption between 2012 and 2024 will grow between 0.88 and 1.82 percent per year, with peak demand growing between 0.97 and 1.92 percent over the same period (CEC 2013b). Further, additional energy efficiency measures are needed to meet the Assembly Bill (AB) 32 greenhouse gas (GHG) reduction goal of reducing statewide GHG emissions to 1990 levels by 2020. For a discussion on AB 32, please see *Chapter 3.10, Greenhouse Gas Emissions*.

In 2002, California established its Renewable Portfolio Standard program[1] with the goal of increasing the annual percentage of renewable energy in the state's electricity mix by the equivalent of at least 1 percent of sales, with an aggregate total of 20 percent by 2017. The California Public Utilities Commission (CPUC) subsequently accelerated that goal to 2010 for retail sellers of electricity (Public Utilities Code Section 399.15(b)(1)). Governor Schwarzenegger signed Executive Order S-14-08 in 2008, increasing the target to 33 percent renewable energy by 2020.

Regional Setting

The Turlock Irrigation District (TID) provides power to the study area, and would likely supply energy required for project operation. TID has various generating facilities including small and large hydroelectric, natural gas power plants, wind, and solar. TID's Board of Directors adopted a goal of 20% renewable energy by 2017. As of 2010, the energy portfolio of the District consists of 28% renewable (TID 2010a). In summer 2009, TID installed a 70.7 kilowatt solar facility atop their newly renovated parking structure which is expected to generate 132,460 kilowatt-hours per year (TID 2010b). Also, on May 28, 2009, the Tuolumne Wind Project began commercial operation. The project, located in Klickitat

[1] The Renewable Portfolio Standard is a flexible, market-driven policy to ensure that the public benefits of wind, solar, biomass, and geothermal energy continue to be realized as electricity markets become more competitive. The policy ensures that a minimum amount of renewable energy is included in the portfolio of electricity resources serving a state or country.

County, in Washington state, consists of 62 turbines which generate a total of 136.6 megawatts (TID 2010a). These two projects contributed to TID exceeding their goal 7 years earlier than planned. The District is also the majority owner and operating partner of the Don Pedro Hydroelectric Project, which can generate up to 203 megawatts from its four generators (TID 2010c).

In addition to renewables, the District also has several natural gas power plants. The Almond 2 Power Plant, opened in 2012, added 174 megawatts of output to TID's portfolio (TID 2013). The 250-megwatt Walnut Energy Center is among the cleanest power generating facilities of comparable size in the nation; its emissions are roughly 85% lower than similar facilities (TID 2013). The Almond and Walnut Power Plants jointly generated roughly 50 megawatts for distribution to TID's customers (TID 2013).

City of Modesto Urban Area General Plan

The City of Modesto Urban Area General Plan serves as a blueprint for future growth within the City. The Plan outlines policies that focus on a community vision (City of Modesto 2008). The following policies in the Urban Area General Plan relating to energy resources would apply to the project:

> *Overall Energy Conservation Policy (e)***:** The City of Modesto shall coordinate with Modesto and Turlock Irrigation District (for electricity) and PG&E (for natural gas) on all new, large-scale, development proposals in the City.
>
> *Overall Energy Conservation Policy (r):* The City shall encourage new residential, commercial, and industrial development to reduce air quality impacts from area sources and from energy consumption.

3.6.2 Regulatory Framework

This section describes laws and regulations that may apply to the proposed project.

Federal Policies and Regulations

National Energy Conservation Policy Act

The National Energy Conservation Policy Act serves as the underlying authority for federal energy management goals and requirements. Signed into law in 1978, it is regularly updated and amended by subsequent laws and regulations. This act is the foundation of most federal energy requirements.

National Energy Policy Act of 2005

The National Energy Policy Act of 2005 sets equipment energy efficiency standards and seeks to reduce reliance on nonrenewable energy resources and provide incentives to reduce current demand on these resources. For example, under the Act, consumers and businesses can attain federal tax credits for purchasing fuel-efficient appliances and products, including hybrid vehicles; constructing energy-efficient buildings; and improving the energy efficiency of commercial buildings. Additionally, tax credits are available for the installation of qualified fuel cells, stationary microturbine power plants, and solar power equipment. Executive Order 13423 (Strengthening Federal Environmental, Energy, and Transportation Management), signed in 2007, strengthens the key energy management goals for the federal government, and sets more challenging goals than the Energy Policy Act of 2005. The energy reduction and environmental performance requirements of Executive Order 13423 were expanded upon in Executive Order 13514 (Federal Leadership in Environmental, Energy, and Economic Performance) signed in 2009.

State Policies and Regulations

California Energy Action Plan

California's Energy Action Plan II is the state's principal energy planning and policy document (CPUC and CEC 2005). The plan describes a coordinated implementation plan for state energy policies and refines and strengthens California's original Energy Action Plan I published in 2003. California Energy

Action Plan II identifies specific action areas to ensure that California's energy is adequate, affordable, technologically advanced, and environmentally sound. It adopts a loading order of preferred energy resources to meet the state's needs and reduce reliance on natural gas and other fossil fuels, also important for achieving GHG emission reductions from the electricity sector.

Energy efficiency and demand response[2] are considered the first ways to meet the energy needs of California's growing population. Renewable energy and distributed generation are considered the best ways on the supply side. To the extent that energy efficiency, demand response, renewable resources, and distributed generation are unable to satisfy increasing energy and capacity needs, CEC supports clean and efficient fossil fuel-fired generation to meet California's energy needs. The 2008 Energy Action Plan Update provides a status update to the 2005 Energy Action Plan II and continues the goals of the original California Energy Action Plan (CPUC and CEC 2008).

State Alternatives Fuel Plan

The State Alternatives Fuel Plan (California Air Resources Board [CARB] and CEC 2007) presents strategies and steps that California must take to increase the use of alternative fuels without adversely affecting air quality, water quality, or causing negative health effects. The plan recommends alternative fuel targets of 9 percent in 2012, 11 percent in 2017, and 26 percent by 2022. The plan also presents a 2050 Vision that extends the plan outcomes and presents a transportation future that greatly reduces the energy needed for transportation, provides energy through a diverse set of transportation fuels, eliminates over-dependency on oil, and achieves an 80 percent reduction in GHG emissions. With these goals, more than 4 billion gasoline gallon equivalents (20 percent) would be displaced by alternative fuels in 2020. CEC estimates that by 2050, alternative fuels could provide more than half of the energy needed to power California's transportation system.

Local Policies and Regulations

Stanislaus County and the City of Modesto do not have any specific policies relating to energy resources that are applicable to the project.

3.6.3 Impact Analysis/Environmental Consequences

Methodology for Analysis

This section evaluates whether construction and operation of the facilities associated with the proposed project would result in significant impacts related to energy resources. The analysis is based on a review of relevant project documentation.

Thresholds of Significance

For the purposes of this analysis, an impact to energy resources would be significant if the proposed project would:

- Result in inefficient, wasteful, or unnecessary consumption of fuels or other energy resources, especially fossil fuels such as coal, natural gas, and oil.

Impacts and Mitigation Measures

Impact ENE-1 Inefficient, Wasteful, Or Unnecessary Use of Energy Resources

Combined Alignment Alternative

Construction and operation of the North Valley Regional Recycled Water Program would require the use of fuels (primarily gas, diesel, and motor oil) for a variety of construction activities, including excavation,

[2] Demand response is the reduction of customer energy usage during peak periods in order to address system reliability and support the best use of energy infrastructure.

grading, and vehicle travel. During these activities, fuel for construction worker commute trips would be minor in comparison to the fuel used by construction equipment. While the precise amount of construction and operation-related energy consumption is uncertain, use of these fuels would not be wasteful or unnecessary because their use is necessary to contribute to the long-term distribution, use, and reliability of water resources within the study area.

However, excessive idling and other inefficient site operations during construction could result in the inefficient use of fuels. Therefore, impacts related to the inefficient use of fuels during construction would be potentially significant. As discussed in *Chapter 3.3, Air Quality*, mitigation efforts would reduce the impacts related to the inefficient use of construction-related fuels to less than significant. Implementation of **Mitigation Measure AIR-1: Reduce NOx Emissions**, would ensure that equipment is properly tuned and that restrictions on idling are enforced.

Separate Alignment Alternative

In addition to the impacts listed under the Combined Alignment Alternative, impacts would also include the energy associated with construction of an additional pump station at the western end of the Harding Drain Bypass Pipeline. Because the amount of energy consumed during operation for the Combined Alignment and the Separate Alignment are very similar, the only net increase impacts would be as a result of constructing the additional pump station. Implementation of **Mitigation Measure AIR-1: Reduce NOx Emissions**, would ensure that equipment is properly tuned and that restrictions on idling are enforced during construction.

PID Conveyance Alternative

This alternative is expected to require less construction energy because of the shorter length of pipeline. Construction of the expanded intake facility would be a substantial construction effort, but is not expected to require more energy than construction of the two river crossings that are included in the Separate Alignment Alternative. Implementation of **Mitigation Measure AIR-1: Reduce NOx Emissions**, would ensure that equipment is properly tuned and that restrictions on idling are enforced during construction.

No Action Alternative

If no action were taken, there would be no energy resource impacts within the proposed study area.

Significance Determination before Mitigation

Potentially significant for all action alternatives.

Mitigation Measures

See **Mitigation Measure AIR-1: Reduce NOx Emissions (Alternatives 1, 2 and 3)**, in *Chapter 3.3 Air Quality*.

Significance Determination after Mitigation

Less than significant.

3.6.4 References

California Air Resources Board (CARB) and California Energy Commission (CEC). 2007. State Alternatives Fuels Plan Commission Report. December, 2007. Available at: http://www.energy.ca.gov/2007publications/CEC-600-2007-011/CEC-600-2007-011-CMF.PDF

California Energy Commission (CEC). 2014a. California Electricity Statistics & Data. Accessed on: 18 July 2014.

California Energy Commission (CEC). 2011. California's Major Sources of Energy, April 7, 2011. Accessed on: 18 July 2014.

California Energy Commission (CEC). 2013a. Total Electricity System Power, Total System Power for 2012: Changes from 2011. Accessed on: 18 July 2014.

California Energy Commission (CEC). 2013b. Integrated Energy Policy Report 2013. Available at: http://www.energy.ca.gov/2013publications/CEC-100-2013-001/CEC-100-2013-001-CMF.pdf

California Public Utilities Commission (CPUC) and California Energy Commission (CEC). 2005. State of California Energy Action Plan II. February, 2008. Available at: http://www.energy.ca.gov/2008publications/CEC-100-2008-001/CEC-100-2008-001.PDF

California Public Utilities Commission (CPUC) and California Energy Commission (CEC). 2008. 2008 Update Energy Action Plan. September 21, 2005. Available at: http://www.energy.ca.gov/energy_action_plan/2005-09-21_EAP2_FINAL.PDF

Modesto, City of. 2008. Final Urban Area General Plan. October 14. Available at: https://www.modestogov.com/ced/pdf/planning/documents/general-plan/technical/Urban%20Area%20General%20Plan.pdf

Turlock Irrigation District (TID). 2010a. Tuolumne Wind Project Fact Sheet. Available at: http://www.tid.org/sites/default/files/documents/tidweb_content/Tuolumne%20Wind%20Fact%20Sheet.pdf

Turlock Irrigation District (TID). 2010b. Power, Generation Facilities. Accessed on: 18 July 2014.

Turlock Irrigation District (TID). 2010c. Don Pedro Reservoir Fact Sheet. Available at: http://www.tid.org/sites/default/files/documents/tidweb_content/Don%20Pedro%20Reservoir%20Fact%20Sheet_Web.pdf

Turlock Irrigation District (TID). 2013. Natural Gas Power Plants, Generation Facilities. Accessed on: 15 July 2014.

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3.7 Environmental Justice

The CEQ's guidance document on environmental justice under NEPA (1997), in referencing Executive Order 12898, states that "each federal agency should analyze the environmental effects, including human health, economic, and social effects of Federal actions, including effects on minority populations, low-income populations, and Indian tribes, when such analysis is required by NEPA."

The Proposed Project would be limited to pipelines and appurtenances, including a new pump station, for conveyance of recycled water at locations generally distant from people. The study area is a sparsely populated area of unincorporated Stanislaus County dominated by agricultural fields. Construction-related impacts of the Proposed Project would be temporary, lasting only for the 1.5-year construction period, and would not disproportionately affect any portion of the population. This would be true of all three action alternatives.

As a result, detailed analysis of environmental effects on minority populations, low-income populations and Indian tribes is not considered necessary, as there is no potential for significant adverse environmental effects. All three action alternatives would more likely benefit low-income and minority populations by providing a long-term source of water and thereby stabilizing the agricultural labor market. The Project would also generate short-term employment opportunities during construction.

3.7.1 References

Council on Environmental Quality. 1997. Environmental Justice: Guidance Under the National Environmental Policy Act. Available: http://www.epa.gov/environmentaljustice/resources/policy/ej_guidance_nepa_ceq1297.pdf.

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3.8 Geology and Soils

This section presents the physical and regulatory setting for geology and soils within and surrounding the proposed project. The impact analysis evaluates the potential adverse impacts of the NVRRWP related to local geology, existing soil conditions, or seismicity that could result from the implementation of the proposed project. The analysis is based on a review of geologic maps and reports including geologic and geotechnical reports and information from state and local agencies.

3.8.1 Environmental Setting/Affected Environment

This section describes the environmental setting for geologic resources and hazards within study area, which includes the project site and geologic features in the project vicinity that could affect project facilities.

Regional Geology

The proposed project is located within California's San Joaquin Valley, approximately 13 miles west of the City of Turlock and 15 miles southwest of the City of Modesto. The study area falls to the east of Interstate 5 and to the west of California Highway 99 in an area referred to as the Great Valley geomorphic province (California Geologic Survey [CGS] 2002). The Great Valley province is roughly 50 miles wide and 400 miles long and runs down the middle of California. The Sacramento Valley, drained by the Sacramento River, forms the northern part of the province and the San Joaquin Valley, drained by the San Joaquin River, forms the southern portion. The Great Valley region largely consists of Quaternary deposits from the Pleistocene and Holocene epochs. These deposits are largely non-marine consolidated and unconsolidated alluvium, lake, playa, and terrace deposits that have been accumulating over millions of years (CGS 2010).

Known for its rich soils, the region has become California's center for agricultural activities, and includes all three counties served by DPWD. The topography of the region is also very flat, which makes the area further suitable for agriculture and other farming activities (refer to *Chapter 3.2 Agriculture and Forestry Resources*). The land begins to increase in elevation west of the project area and Interstate 5.

Soils

Soil Types

The National Resources Conservation Service (NRCS) has a system of soil classification. At the highest level of classification are 12 orders of soil taxonomy (NRCS 2013). Subsequent levels include suborders and great groups. There are three orders represented within the project area, including Alfisols, Inceptisols, and Mollisols. General descriptions of each of these orders are presented below.

Alfisols are typically found in semiarid to moist areas and are a result of weathering processes that leach clay minerals and other constituents out of the surface layer and into the subsoil (NRCS 2013). Thus, this soil type has a high base saturation and an enriched subsoil that supplies nutrients and moisture to plants. These characteristics make this soil type very productive for agricultural activities.

Inceptisols are found in semiarid to humid environments. These soils generally exhibit only moderate degrees of soil weathering and development that display a weak but noticeable soil profile (NRCS 2013). Because of their low degree of development, Inceptisols include a diverse collection of soils. Generally, this soil type occurs in areas that are, from a geomorphic perspective, relatively young. This includes areas such as the Great Valley.

Mollisols are typically found in temperate grasslands at mid-latitudes. This soil type is characterized by a dark, organic-rich surface horizon (NRCS 2013). In relatively dry areas such as the study area, leaching is not a dominant force. As such, there is likely calcium carbonate accumulation, calcium carbonate

cementation, or silica cementation, which is evident by a white layer just below the surface layer. The soil profile is generally organic-rich throughout with high base nutrients which makes Mollisols highly productive and suitable for agricultural production.

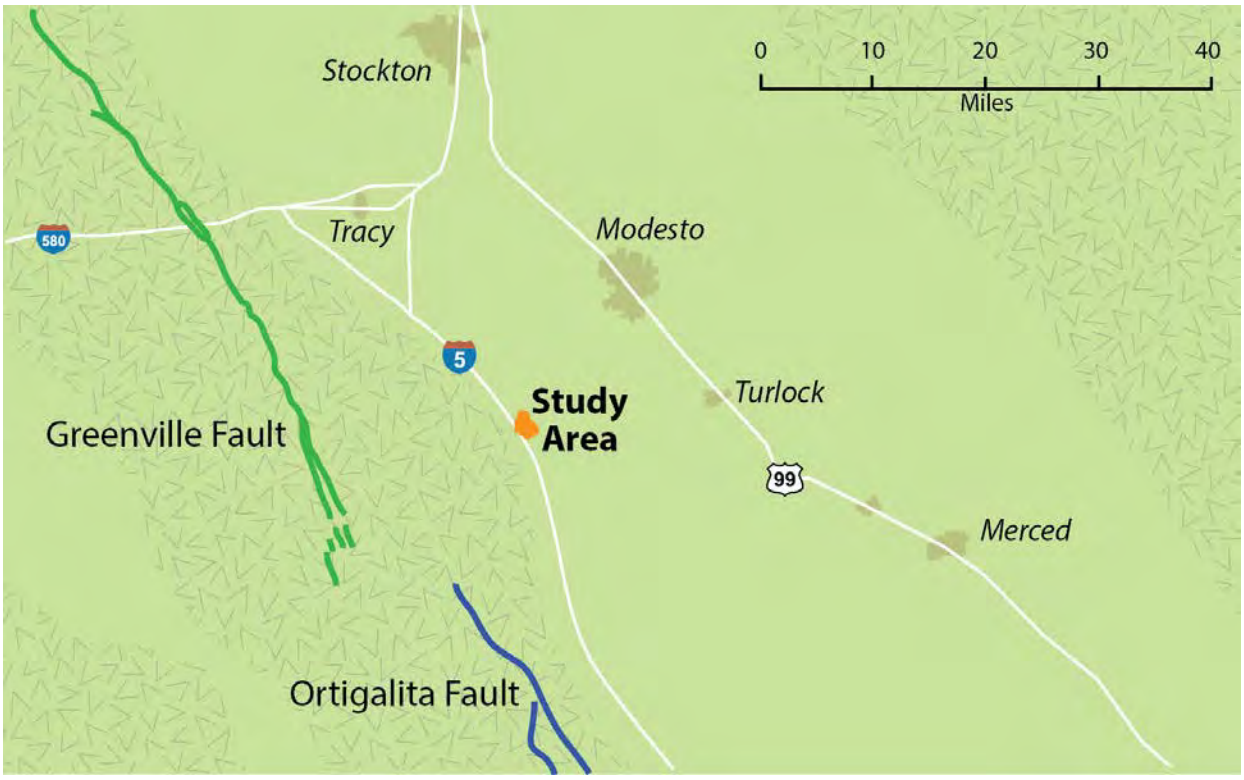
Potential for Expansive Soils

Expansive soils are soils capable of absorbing high amounts of water. As more water is absorbed by the soil, the soil begins to expand, thus potentially damaging structures, including pipelines. Some soil in the project area is characterized as clay with slight to moderate swelling potential (United States Geological Survey [USGS] 1989).

Seismicity, Landslides, and Liquefaction

There are several known faults within the region, including the Greenville and Ortigalita faults (see **Figure 3.8-1**). The Greenville fault runs from central Contra Costa County, down through the eastern portion of Alameda County and ends in the northeastern tip of Santa Clara County, next to the border of Santa Clara and Stanislaus Counties. The Greenville fault last ruptured in 1980, resulting in a magnitude 5.6 earthquake (CGS 2007). The Ortigalita fault begins in the southwestern part of Stanislaus County and runs the length of Merced County, ending at the border of Merced and Fresno Counties. There has been no historic surface rupture of the Ortigalita fault (CGS 2007).

Figure 3.8-1: Principal Faults Zoned under Alquist-Priolo Earthquake Fault Zoning Act 1974-2007



Source: CGS 2007

Strong ground motions can worsen existing unstable slope conditions, particularly if coupled with saturated ground conditions. Although numerous types of earthquake-induced landslides have been identified, the most widespread type generally consists of shallow failures involving surface soils and the uppermost weathered bedrock in moderate to steep hillside terrain. Rock falls and rock slides on very steep slopes are also common. While there are areas west of Interstate-5 that are susceptible to landslides, the study area is flat and therefore the risk of landslides is negligible (CGS 2011; CDOC 2007).

Liquefaction typically occurs in loose, saturated sediments consisting primarily of sandy composition in the presence of ground accelerations caused by earthquakes. When liquefaction occurs, the sediments involved have a total or substantial loss of shear strength and behave like a liquid or semi-viscous substance. Three general conditions must be met for liquefaction to occur: (1) strong seismic ground-shaking of relatively long duration; (2) loose, or unconsolidated, recently deposited sediments consisting primarily of silty-sand and sand; and (3) water-saturated sediments within about 50 feet of the surface. While no specific liquefaction hazards have been identified in Stanislaus County, certain locations within the study area may be susceptible to liquefaction due to higher water tables and unconsolidated, granular soils (CDOC 2007). Areas with sandy, saturated soils, such as the areas adjacent to the San Joaquin River, may be at increased risk for liquefaction.

3.8.2 Regulatory Framework

This section describes laws and regulations that may apply to the proposed project. There are no federal policies or programs associated with geology and soils that would apply to the proposed project.

State Policies and Regulations

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act was adopted in 1972, and is designed to restrict certain development along active faults. The Act requires that the State Geologist delineate earthquake fault zones around the surface traces of active faults and to maintain maps outlining these zones. Active faults are defined as faults that have been active within the last 11,000 years. The purpose of these zones is to prevent the construction of buildings used for human occupancy within an earthquake fault zone. In addition to delineating earthquake fault zones, the Act requires disclosure of properties located within an earthquake fault zone when buying or selling a property. The Act was first designated as the Alquist-Priolo Geologic Hazard Zones Act, but was later changed to the Alquist-Priolo Special Studies Zones Act in 1975 and changed again in 1994 to the Alquist-Priolo Earthquake Fault Zoning Act (CGS 2007). The proposed project is not located within a Fault-Rupture Hazard Zone designated by the Alquist-Priolo Earthquake Fault Zoning Act of 1972 and Special Publication 42.

California Building Code

The California Building Code (CBC), which is codified in California Code of Regulations (CCR) Title 24, Part 2, was promulgated to safeguard the public health, safety, and general welfare by establishing minimum standards related to structural strength, egress facilities, and general building stability. The purpose of the CBC is to regulate and control the design, construction, quality of materials, use/occupancy, location, and maintenance of all building and structures within its jurisdiction. Title 24 is administered by the California Building Standards Commission, which, by law, is responsible for coordinating all building standards. Under state law, all building standards must be centralized in Title 24 or they are not enforceable.

The CBC is based on the International Building Code. The 2007 CBC is based on the 2006 International Building Code published by the International Code Conference. In addition, the CBC contains necessary California amendments that are based on the American Society of Civil Engineers (ASCE) Minimum Design Standards 7-05. ASCE 7-05 provides requirements for general structural design and includes means for determining earthquake loads as well as other loads (flood, snow, wind, etc.) for inclusion in building codes. The provisions of the CBC apply to the construction, alteration, movement, replacement, and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures throughout California.

The earthquake design requirements take into account the occupancy category of the structure, site class, soil classifications, and various seismic coefficients, all of which are used to determine a Seismic Design Category (SDC) for a project. The SDC is a classification system that combines the occupancy categories

with the level of expected ground motions at the site and ranges from SDC A (very small seismic vulnerability) to SDC E/F (very high seismic vulnerability and near a major fault). Design specifications are then determined according to the SDC. Compliance with the CBC would be necessary for the new Harding Drain Bypass Pipeline pump station and possibly for certain grading activities on the project site.

Local Policies and Regulations

Stanislaus County General Plan

The Stanislaus County General Plan guides development for the County with a 20-year planning horizon. The following policies outlined in the Agricultural and Safety elements of the County's General Plan would apply to the project:

> *Policy Three Point Six*– The County shall encourage the conservation of soil resources (Agriculture Element)
>
> *Policy Three*—Development should not be allowed in areas that are particularly susceptible to seismic hazard (Safety Element)

3.8.3 Impact Analysis/Environmental Consequences

Methodology for Analysis

This section evaluates whether construction and operation of the facilities associated with the proposed project would result in significant impacts related to geology and soils. The analysis is based on a review of geologic maps and reports including geologic and geotechnical reports and information from state and local agencies.

Thresholds of Significance

Consistent with Appendix G of the *CEQA Guidelines,* a geology and soils impact would be considered significant if the project would:

- Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:
    - Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault (refer to Division of Mines and Geology Special Publication 42);
    - Strong seismic ground-shaking;
    - Seismic-related ground failure, including liquefaction;
    - Landslides;
- Result in substantial soil erosion or loss of topsoil;
- Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse;
- Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property;
- Be located on soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater.

Criteria Requiring No Further Evaluation

Criteria listed above that are not applicable to actions associated with the proposed project are identified below along with a supporting rationale as to why further consideration is unnecessary and a no-impact determination is appropriate.

- *Rupture of a Known Earthquake Fault*– The proposed project is not located within a Fault-Rupture Hazard Zone designated by the Alquist-Priolo Earthquake Fault Zoning Act of 1972 and Special Publication 42. The two nearest active faults are the Greenville and Ortigalita faults, which are located approximately 17 and 15 miles away, respectively (CGS 2007). Since there are no known faults in the project vicinity, there would be no impact associated with the rupture of a known earthquake fault.
- *Landslides* – The study area is located in an agricultural valley, and is relatively flat. As such, the study area is not located on or adjacent to a hillside, exposed rock face, or cliff. According to California Geologic Survey, the study area is in the lowest class for susceptibility to landslides (CGS 2011). The California State Department of Conservation also indicates that the study area is not at risk for landslides (CDOC 2007). Therefore, there would be no project impacts related to risk of loss, injury, or death involving landslides.
- *Soils Incapable of Adequately Supporting the Use of Septic Tanks or Alternative Wastewater Disposal Systems* – The proposed project would not generate wastewater, and would not require the installation of septic tanks or alternative wastewater disposal systems. Therefore, there would be no project impacts related to adequate support of septic tanks or alternative wastewater disposal systems.

Impacts and Mitigation Measures

Impact GEO-1 Facility Damage and Exposure of People to Hazards from Strong Seismic Groundshaking and Liquefaction

Combined Alignment Alternative

Most structures, including buildings and pipelines, are subject to damage from earthquakes. The intensity of such an event would depend on which fault the earthquake occurs, the distance of the epicenter from the project site and the duration of shaking. While the proposed project is not located within a Fault-Rupture Hazard Zone designated by the Alquist-Priolo Earthquake Fault Zoning Act of 1972 and Special Publication 42, there are two active faults within 20 miles of the study area. The Greenville fault is located approximately 17 miles northwest of the study area and Ortigalita fault is located to the southwest roughly 15 miles away (CGS 2007). These faults could cause groundshaking of an intensity approaching ten on the Modified Mercalli Scale, which would cause considerable damage to the proposed project elements, including the pump station and pipelines, and pose a significant threat to public safety if pipe were to burst and cause flooding (Stanislaus County 1994).

Additionally, as mentioned above in *Section 3.8.1*, the study area may be susceptible to liquefaction. The high groundwater table and unconsolidated soils, while good for agriculture, may contribute to the liquefaction risk. Additionally, the sandy, saturated soils adjacent to the San Joaquin River could potentially experience liquefaction. With implementation of **Mitigation Measure GEO-1**, these seismic-related impacts would be reduced to a less-than-significant level.

Separate Alignment Alternative

Impacts would be the same as Combined Alignment Alternative.

PID Conveyance Alternative

Impacts would be the same as Combined and Separate Alignment Alternatives.

No Action Alternative

If no action were taken, there would be no geology or soils impacts within the study area.

Significance Determination before Mitigation

Potentially significant for all action alternatives.

Mitigation Measures

Mitigation Measure GEO-1: Perform Design-Level Geotechnical Evaluations for Seismic Hazards (Alternatives 1, 2 and 3)

During the design phase for the proposed project, perform site-specific, design-level geotechnical evaluations to identify potential secondary ground failure hazards (i.e., seismically-induced settlement) associated with the expected level of seismic ground shaking. A geotechnical memorandum shall be prepared to detail the findings of the evaluations.

The geotechnical analysis will provide recommendations to mitigate those hazards in the final design and, if necessary, during construction. The design-level geotechnical evaluations, based on the site conditions, location, and professional opinion of the geotechnical engineer, may include subsurface drilling, soil testing, and analysis of site seismic response to determine appropriate feasible measures to be incorporated into the project design. The performance standard to be used in the geotechnical evaluations will be minimization of the hazards associated with liquefaction and seismic groundshaking. The geotechnical engineer will review the seismic design criteria of facilities to ensure that facilities are designed to withstand the highest expected peak acceleration, set forth by the California Building Code for each site, and ensure that secondary ground failures, such as liquefaction, are minimized. Recommendations resulting from findings of the geotechnical study will be incorporated into the design and construction of proposed facilities.

Significance Determination after Mitigation

Less than significant for all action alternatives.

Impact GEO-2 Risk to Property and Life from Expansive Soils

Combined Alignment Alternative

While repurposing the existing Jennings Plant outfall pump station would not increase the risk from expansive soils, the proposed pipelines may be affected by expanding soils. With implementation of **Mitigation Measure GEO-2**, this impact would be reduced to a less-than-significant level.

Separate Alignment Alternative

Impacts would be the same as the Combined Alignment Alternative.

PID Conveyance Alternative

Impacts would be the same as the Combined and Separate Alignment Alternatives.

No Action Alternative

If no action were taken, there would be no geology or soils impacts within the study area.

Significance Determination before Mitigation

Potentially significant for all action alternatives.

Mitigation Measures

Mitigation Measure GEO-2: Perform Design-Level Geotechnical Evaluations for Soil Expansion (Alternatives 1, 2 and 3)

During the design phase for all components of the project, a design-level geotechnical evaluation to determine the presence and characteristics of potentially compressible and expansive soils, the engineering properties of the foundation material, and the depth and thickness of soil layers will be completed. The results of the investigations will include measures that would reduce soil expansion to a less-than-significant level. Feasible mitigation measures could include removal and replacement of soil, deep foundations, or deep mixing of compressible or expansive soils with stabilizing agents. All mitigation measures included in the geotechnical evaluation will be incorporated into the project design specifications.

Significance Determination after Mitigation

Less than significant for all action alternatives.

Impact GEO-3 Result in Substantial Soil Erosion or Loss of Topsoil

Combined Alignment Alternative

Construction activities associated with the proposed project are anticipated to disturb more than 1.0 acre of soil. As such, construction of the proposed project would be required to comply with the Construction General Permit (Order No. 2009-0009-DWQ), which is issued by the SWRCB (refer to *Chapter 3.11, Hydrology and Water Quality*). The Construction General Permit requires development of a Stormwater Pollution Prevention Plan (SWPPP), which outlines Best Management Practices (BMPs) the discharger would use to reduce erosion and topsoil loss from storm water runoff. Compliance with the Construction General Permit would ensure construction of facilities follows mandated BMPs, and therefore would not result in substantial soil erosion or the loss of topsoil. Impacts are considered less than significant and no mitigation is required.

Separate Alignment Alternative

Impacts would be the same as Combined Alignment Alternative.

PID Conveyance Alternative

Impacts would be the same as Combined and Separate Alignment Alternatives.

No Action Alternative

If no action were taken, there would be no geology or soils impacts within the study area.

Significance Determination before Mitigation

Less than significant for all action alternatives.

Mitigation Measures

No mitigation measures are required.

Cumulative Impacts

The geographic scope of potential cumulative impacts related to geology and soils encompasses the project site and immediate vicinity. There are three relevant projects within the immediate vicinity of the proposed project that may contribute to cumulative impacts:

- Jennings Treatment Plant Phase 2 Upgrades: increase tertiary treatment capacity by 12.6 MGD;
- West Main Improvement Project: widen West Main Ave to 3 lanes from the San Joaquin River to Crows Landing Road (Stanislaus County Department of Public Works 2011);

- StanCOG South Corridor Study: study potential alignments and corridor options for an expressway from the City of Turlock on the east to I-5 on the west (Stanislaus County Department of Public Works 2011).

While potential cumulative impacts related to geology, seismicity, and soils are generally site-specific and depend on local geologic and soil conditions, there may be cumulative impacts associated with the proposed project and the projects listed above, particularly related to seismically induced groundshaking and ground failures (expansive soils). However, these impacts would be less than significant with implementation of **Mitigation Measures GEO-1** and **GEO-2**, which require geotechnical evaluations for these seismic hazards.

3.8.4 References

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3.9 Greenhouse Gas Emissions

This section evaluates the potential adverse impacts related to greenhouse gas (GHG) emissions that could result from implementation of the proposed project. The analysis is based on a review of current GHG conditions, inventory of the proposed project GHG emissions, and information from state and local agencies.

3.9.1 Environmental Setting/Affected Environment

Study Area

Climate change is a global issue and planning surrounding it has been conducted at the state level. Accordingly, the study area for the purposes of GHG emissions considers global GHG emissions in the context of statewide GHG emissions reduction targets that will allow for California to do its share in reducing GHG emissions globally.

Global Climate Change

Global warming and global climate change are terms that describe changes in the Earth's climate. Global climate change is a broader term, used to describe any worldwide, long-term change in the Earth's climate. This change could be, for example, an increase or decrease in temperatures, the start or end of an ice age, or a shift in precipitation patterns. The term global warming is more specific and refers to a general increase in temperatures across the Earth. Although global warming is characterized by rising temperatures, it can cause other climatic changes, such as a shift in the frequency and intensity of rainfall or hurricanes. Global warming does not necessarily imply that all locations will be warmer. Some specific, unique locations may be cooler even though the Earth, on average, is warmer. All of these changes fit under the umbrella of global climate change.

Because GHGs persist and mix in the atmosphere, they have impacts on a global scale, rather than locally or regionally like most air pollutants. Consequently, GHG emissions that contribute to global climate change result in a worldwide cumulative impact (global warming) rather than a local or regional project-specific impact typically associated with criteria pollutants. Impacts related to GHG emissions are discussed in the context of the proposed project's contribution to statewide and global GHG emissions.

Although natural processes can cause global warming, general scientific consensus is that present-day global warming is the result of human activity on the planet (IPCC 2007, 2013). This human-made, or anthropogenic, warming is caused primarily by increased GHG emissions, which keep the Earth's surface warm, known as "the greenhouse effect." The greenhouse effect and the role GHG emissions play in it are described below.

The Greenhouse Effect and Other Climate Change Effects

The Earth's atmosphere functions like a greenhouse, allowing sunlight in and trapping some of the heat that reaches the Earth's surface. When solar radiation from the sun enters the Earth's atmosphere, a small portion is reflected back toward space, although a majority of it is absorbed by the Earth's surface. The solar radiation that is absorbed by the Earth's surface then is re-emitted as heat in the form of low-frequency infrared radiation. Although GHGs in the atmosphere do not absorb solar radiation, they do absorb the lower frequency infrared radiation, thereby trapping it within the Earth's atmosphere and resulting in the warming of the Earth's surface.

The Earth's greenhouse effect has existed far longer than humans have, and it has played a key role in the development of life. Concentrations of major GHGs (discussed in further detail under Greenhouse Gases and their Emissions below) such as carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and water vapor (H_2O) have been naturally present for millennia at relatively stable levels in the atmosphere, adequate to keep temperatures on the Earth hospitable. Without these GHGs, the Earth's temperature

would be too cold for life to exist. However, as human industrial activity has increased, atmospheric concentrations of certain GHGs have grown dramatically. Anthropogenic sources are responsible for GHG emissions in excess of naturally occurring concentrations, thereby intensifying the greenhouse effect and resulting in global climate change.

The Intergovernmental Panel on Climate Change's (IPCC) Fourth Assessment Report: Climate Change 2007 stated that scientific consensus concurs that the global increases in atmospheric concentrations of GHGs since 1750 mainly have resulted from human activities such as fossil fuel use, land use change (e.g., deforestation), and agriculture (IPCC 2007; IPCC 2013). In addition, the report stated that it is likely that these changes in GHG concentrations have contributed to global warming. Confidence levels of claims in this report have increased since 2001, because of the large number of simulations run and the broad range of available climate models.

Global climate change is particularly important when discussing water infrastructure and supply. Changes in the climate are expected to cause more severe droughts and changes in annual rainfall and snowpack. Thus, it is important that the water infrastructure and supply is adapted to meet these climate change impacts.

Greenhouse Gases and Their Emissions

The term "greenhouse gases" includes gases that contribute to the natural greenhouse effect as well as gases that are human-generated and are emitted by modern industrial products, such as hydrofluorocarbons (HFCs), chlorinated fluorocarbons, and sulfur hexafluoride. These last two families of gases, although not naturally present, have properties that also cause them to trap infrared radiation when they are present in the atmosphere, thus making them GHGs. The effect each of these gases has on global warming is a combination of the volume of their emissions and their global warming potential (GWP). GWP indicates, on a pound for pound basis, how much a gas will contribute to global warming (its potential to trap heat) relative to how much warming would be caused by the same mass of carbon dioxide. **Table 3.9-1** shows the six GHGs and their respective GWPs.

Table 3.9-1: Greenhouse Gas Overview and Global Warming Potential

GHG	GWP 100-year[1]	Brief Description
CO_2	1/1	Released into the atmosphere through burning fossil fuels (coal, natural gas and oil), solid waste, trees and wood products, and also because of certain chemical reactions; removed from the atmosphere when it is absorbed by plants and the ocean; remains in the atmosphere for 50 to more than 100,000 years.
CH_4	28/21	Emitted during production and transport of coal, natural gas, and oil; methane emissions also result from livestock and other agricultural practices and by decay of organic waste in municipal solid waste landfills; remains in the atmosphere for about 10 years.
N_2O	265/310	Emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste; remains in the atmosphere for about 100 years.
Hydroflouro-carbons (HFCs)	4-12,400/ 650–11,700	Typically used in refrigeration and air conditioning equipment, as well as in solvents; emissions primarily generated from use in air conditioning systems in buildings and vehicles; remain in the atmosphere from 10 to 270 years.
Perflouro-carbons (PFCs)	6,630-11,100/ 6,500–9,200	Emitted as by-products of industrial and manufacturing sources; remain in the atmosphere from 800 to 50,000 years.
Sulfur Hexa-fluoride (SF_6)	23,500/23,900	Used in electrical transmission and distribution; remain in the atmosphere approximately 3,200 years.

Notes:

1. As scientific understanding of global warming potentials of GHGs improves over time, GWP values are updated in the IPCC scientific assessment reports. However, for regulatory consistency, the Kyoto Protocol fixed the use of GWP values to those published in the IPCC 1996 Second Assessment Report (SAR). The table above shows GWP values for 100 years from both the IPCC 2013 and SAR.

Sources: EPA 2013 and IPCC 2007

These six gases are the major GHGs that were recognized by the Kyoto Accords. Other GHGs were not recognized by the Kyoto Accords, chiefly because of the smaller role that they play in global climate change or the uncertainties surrounding their effects. One GHG not recognized by the Kyoto Accords is atmospheric water (H_2O), because an obvious correlation does not exist between H_2O and specific human activities. H_2O appears to act in a feedback manner; higher temperatures lead to higher H_2O concentrations, which in turn cause more global warming (IPCC 2003). A second GHG not recognized in the initial Kyoto Accords but subsequently included by the United Nations Framework Convention on Climate Change and recognized in California as a GHG is nitrogen trifluoride.

The most important GHG in human-induced global warming is CO_2. Although many gases have much higher GWPs than the naturally occurring GHGs, CO_2 is emitted in such vastly higher quantities that it accounts for 85 percent of the GWP of all GHGs emitted by the U.S. (EPA 2006). Fossil fuel combustion, especially for the generation of electricity and powering of motor vehicles, has led to substantial increases in CO_2 emissions over time and, thus, substantial increases in atmospheric CO_2 concentrations. In 2005, atmospheric CO_2 concentrations were about 379 ppm, over 35 percent higher than the pre-industrial concentrations of about 280 ppm (IPCC 2007). In addition to the sheer increase in the volume of its emissions, CO_2 is a major factor in human-induced global warming because of its long lifespan in the atmosphere of 50 to 200 years.

California Climate Impacts

Global temperature increases and other climate changes may have a series of substantial negative effects on the health of California residents and California's economy. These include changing precipitation, snow pack levels, and reduced water supply; reduced air quality; higher risk of infestations by pests and pathogens in agricultural and forest environments; increased wildfire risk; alterations in the coastline and coastal habitats; and increased flood risk (CAT 2006). With respect to compromised air quality, warmer temperatures can cause more ground-level ozone, a pollutant that causes eye irritation and respiratory problems. With regard to water supply, California primarily relies on snowmelt for its drinking water and much of the water used in irrigation during the summer. Global warming could alter, and may already be altering, the seasonal pattern of snow accumulation and snowmelt, and reduce snow pack overall, affecting water supplies.

California GHG Emission Inventory

Since 2000, GHG emissions have decreased by 1.6 percent, after reaching a peak in 2004. In 2012, total California GHG emissions were 459 million metric tons of CO_2 equivalent (CO_2e)[1]. This represents a 1.7 percent increase in total GHG emissions from 2011 and the first emissions increase since 2007. This increase was driven primarily by strong economic growth in the state, the unexpected closure of the San Onofre Nuclear Generating Station, and drought conditions that limited in-state hydropower generation. In 2012, the transportation sector was the largest source of emissions, accounting for approximately 37 percent of the total emissions. On-road vehicles accounted for more than 90 percent of emissions in the transportation sector. The industrial sector accounted for approximately 22 percent of the total emissions. Emissions from electricity generation were about 21 percent of total emissions.

Per capita emissions in California have decreased by 12 percent from 2000 to 2012, even though population increased by 11.4 percent during this period. Per capita emissions from in-state electricity generation have declined by 22 percent from 2000 to 2012.

Climate Change Adaptation

As described above, global climate change is already affecting ecosystems and society throughout the world. Climate change adaptation refers to the efforts undertaken by ecosystems and society to adjust to and prepare for current and future climate change, thereby reducing vulnerability to those changes. Plant and animal species adapt over time to changing conditions; they migrate or change behaviors in accordance with changing climates, food sources, and predators. Similarly, human adaptation has occurred naturally over history; people move to more suitable living locations, adjust food sources, and more recently, change energy sources.

Many national, as well as state and regional, governments, are implementing adaptive practices to address changes in climate, as well as planning for expected future impacts from climate changes. Some examples of adaptations that already are in practice or under consideration include: conserving water and minimizing runoff with climate-appropriate landscaping, capturing excess rainfall to minimize flooding and maintain a constant water supply through dry spells, protecting valuable resources and infrastructure from flood damage, developing new water supply strategies such as water reuse, aquifer storage and recovery, and desalination, and use of water efficient appliances (US EPA 2014).

3.9.2 Regulatory Framework

This section describes laws and regulations at the federal, state, and local level that may apply to the project.

[1] Carbon dioxide equivalent (CO_2e) is a metric measure used to compare the emissions from various greenhouse gases based upon their GWP compared to CO_2. The CO_2e for a gas is derived by multiplying the tons of the gas by the associated GWP. For instance using a GWP of 21 for methane, 1 ton of methane is equal to 21 tons of CO_2e.

Federal Policies and Regulations

U.S. Supreme Court and Endangerment Ruling

The U.S. Supreme Court ruled for the first time in 2007 that GHG emissions are air pollutants, covered under the Clean Air Act, in *Massachusetts v. The Environmental Protection Agency.* The Court found that the U.S. Environmental Protection Agency (EPA) has a mandatory duty to enact rules regulating mobile GHG emissions pursuant to the federal Clean Air Act. The Court held that GHGs fit the definition of an air pollutant causing and contributing to air pollution, which reasonably may be anticipated to endanger public health or welfare. In 2009, the EPA Administrator determined that existing and projected concentrations of GHGs threaten public health and welfare of present-day and future generations, and that combined emissions from motor vehicles contribute to GHG pollution. EPA's endangerment finding covers emissions of six key GHGs: CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6.

Corporate Average Fuel Economy and Greenhouse Gas Emission Standards

In 2009, the National Highway Traffic and Safety Administration (NHTSA) and EPA issued the first joint ruling to establish a national program to regulate model year 2012 through 2016 passenger cars and light trucks, to improve fuel economy and reduce GHG emissions. NHTSA previously had set Corporate Average Fuel Economy standards for vehicle fuel efficiency, but the joint rule was the first coordinated effort between federal programs for fuel economy and GHGs. Since then, NHTSA and EPA have issued new fuel efficiency and GHG emission standards. On August 9, 2011, standards were issued to reduce GHG emissions and improve fuel efficiency for heavy-duty trucks and buses. On October 15, 2012, NHTSA and EPA established a program to reduce GHG emissions and improve fuel economy standards for new cars and light trucks through 2025 (US EPA 2012).

Federal Leadership in Environmental, Energy, and Economic Performance

On October 5, 2009, Federal Executive Order (E.O.) 13514, *Federal Leadership in Environmental, Energy, and Economic Performance,* was signed by the White House Council on Environmental Quality (CEQ). The E.O. required federal agencies to set a 2020 GHG emissions reduction target within 90 days, increase energy efficiency, reduce fleet petroleum consumption, conserve water, reduce waste, support sustainable communities, and leverage federal purchasing power to promote environmentally responsible products and technologies.

GHG in NEPA Documents

On February 18, 2010, CEQ released draft guidance on the consideration of GHGs in NEPA documents for federal actions. The draft guidelines include a presumptive threshold of 25,000 metric tons of carbon dioxide equivalent (CO_2e) emissions from a proposed action to trigger a quantitative analysis. CEQ has not established when GHG emissions are "significant" for NEPA purposes, but rather poses that question to the public (CEQ 2010).

State Policies and Regulations

California Global Warming Solutions Act

The California Air Resources Board (CARB) is the lead agency for implementing Assembly Bill (AB) 32, the California Global Warming Solutions Act, adopted by the State Legislature in 2006. AB 32 set a statewide target to reduce GHG emissions to 1990 levels by 2020. AB 32 also required CARB to prepare a Scoping Plan with the main strategies to be used to achieve reductions in GHG emissions in California.

After receiving public input on their discussion draft of the Proposed Scoping Plan (released in June 2008), CARB issued its Climate Change Proposed Scoping Plan in October 2008, and adopted the plan in December 2008 (CARB 2011b). This plan contains an outline of the proposed State strategies to achieve the 2020 GHG emission limits. Key elements of the Scoping Plan include the following recommendations:

1. Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;
2. Achieving a statewide renewables energy mix of 33 percent;
3. Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system;
4. Establishing targets for transportation-related GHG emissions for regions throughout California and pursuing policies and incentives to achieve those targets;
5. Adopting and implementing measures pursuant to existing State laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel standard;
6. Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the State's long-term commitment to AB 32 implementation.

Under the Scoping Plan, approximately 85 percent of the state's emissions are subject to a cap-and-trade program, where covered sectors are placed under a declining emissions cap. Emissions reductions are to be achieved through regulatory requirements and the option to reduce emissions further or purchase allowances to cover compliance obligations. Emission reductions from this cap-and-trade program are expected to account for a large portion of the reductions required by AB 32.

CARB recently released the First Update of the Climate Change Scoping Plan to reflect progress since 2005, additional reduction measures, and plans for reductions beyond 2020 (CARB 2014). In this update CARB notes the progress toward the 2020 goal to reach 1990 levels established in AB 32. CARB emphasizes the importance of establishing a mid-term target beyond 2020 to reach the goals of executive orders S-03-05 and B-16-2012 to reduce emissions to 80 percent below 1990 levels by 2050 (as described below). This mid-term target will be critical in helping to frame additional policy measures, regulations, planning efforts, and investments in clean technologies that are needed to continue to reduce emissions. Sector-specific actions that would be needed in order to reach long-term goals are outlined for: energy; transportation, land use, fuels, and infrastructure; agriculture; water; waste; and natural and working lands; short-lived climate pollutants; and green buildings. With respect to water, the Plan encourages development of state policy and regulatory frameworks that allow for effective regional integrated planning and implementation with measures to reduce GHG emissions and maintain water supply reliability during drought periods.

Executive Order S-03-05 and B-16-2012

In 2005, Executive Order S-03-05 was issued, calling for statewide GHG reductions to 2000 levels by 2010, to 1990 levels by 2020, and to 80 percent below 1990 levels by 2050. The Executive Order also called for the creation of a "Climate Action Team," which was to report to the Governor every 2 years on progress toward meeting the targets and the effects of GHG emissions on the state. The latest of these reports, Climate Action Team Biennial Report, was published in December 2010 (Cal/EPA 2010). In March 2012, Executive Order B-16-2012 was issued, affirming the long-range climate goal for California to reduce GHGs to 80 percent below 1990 levels by 2050.

Low Carbon Fuel Standard

Executive Order S-1-07, the Low Carbon Fuel Standard (LCFS), was issued in January 2007. The order called for a reduction of at least 10 percent in the carbon intensity of California's transportation fuels by 2020. The LCFS was approved by CARB in 2009, and it became effective in April 2010. The regulation established annual performance standards for fuel producers and importers, applicable to all fuels used for transportation in California (CARB 2011a).

Assembly Bill 1493

With the passage of AB 1493 in 2002, California launched an innovative and pro-active approach for dealing with GHG emissions and climate change at the State level. AB 1493 required CARB to develop and implement regulations to reduce automobile and light truck GHG emissions. These stricter emissions standards apply to automobiles and light trucks beginning with the 2009 model year. Litigation was filed by automakers, challenging these regulations. EPA initially denied California's related request for a waiver to allow California to regulate vehicle emissions beyond EPA requirements, but a waiver subsequently was granted (CARB 2013).

Renewable Portfolio Standard

Established in 2002 under Senate Bill 1078, California's Renewables Portfolio Standard (RPS) was accelerated in 2006 under Senate Bill 107 by requiring that 20 percent of electricity retail sales be served by renewable energy resources by 2010. Subsequent recommendations in California energy policy reports advocated a goal of 33 percent by 2020. Senate Bill X1-2, which implemented the 33 percent by 2020 for electricity sales from renewable energy resources, was signed in April 2011. This new RPS applies to all electricity retailers in the state including publicly owned utilities, investor-owned utilities, electricity service providers, and community choice aggregators (local communities that offer procurement service to electric customers within their boundaries). All of these entities must adopt the new RPS goals of 20 percent of retail sales from renewables by the end of 2013, 25 percent by the end of 2016, and the 33 percent requirement being met by the end of 2020.

Senate Bill 1368

SB 1368 is the companion bill of AB 32 and was signed by Governor Schwarzenegger in September 2006. SB 1368 required the California Public Utilities Commission (CPUC) to establish a GHG emission performance standard for baseload generation from investor owned utilities by February 1, 2007. The California Energy Commission (CEC) was required to establish a similar standard for local publicly owned utilities by June 30, 2007. These standards were not to exceed the GHG emission rate from a baseload combined-cycle natural gas fired plant. The legislation further required that all electricity provided to California, including imported electricity, must be generated from plants that meet the standards set by the CPUC and CEC.

Senate Bill 375

Senate Bill 375, the Sustainable Communities and Climate Protection Act of 2008, enhanced California's ability to reach its AB 32 goals, by promoting good land use and transportation planning with the goal of more sustainable communities. Sustainable Communities requires CARB to develop regional GHG emission reduction targets for 2020 and 2035 for each region covered by one of the state's 18 metropolitan planning organizations (MPOs). Executive Order G-11-024 set these targets in 2011. The MPOs were tasked with developing Sustainable Communities Strategies, integrating land use and transportation planning and demonstrating an ability to attain the 2020 and 2035 reduction targets.

Regional Policies and Regulations

SJVAPCD Climate Change Action Plan

The SJVAPCD's Climate Change Action Plan, adopted in 2008, directed the District Air Pollution Control Officer to develop guidance to assist lead agencies, project proponents, permit applicants, and interested parties in assessing and reducing the impacts of project specific GHG emissions on global climate change (SJVAPCD 2014). On December 17, 2009, the SJVAPCD adopted *Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA* (Guidance) (SJVAPCD 2009). The Guidance establishes a streamlined process that can be used to evaluate the significance of project-specific GHG emission impacts on global climate change, based on the use of Best Performance Standards (BPS) (SJVAPCD 2009). The SJVAPCD defines BPS as "the most effective

achieved-in-practice means of reducing or limiting GHG emissions from a GHG emissions source." Types of BPS include equipment type, equipment design, operational and maintenance practices, measures that improve energy efficiency, and measures that reduce vehicle miles traveled (SJVAPCD 2009).

SJVAPCD Zero Equivalency Policy

The SJVAPCD has not developed CEQA significance thresholds for construction-related GHG emissions. However, the SJVAPCD has adopted a Zero Equivalency Policy for Greenhouse Gases that establishes a level (230 metric tons of carbon dioxide equivalent [CO_2e/year]) below which project-specific increases in GHG emissions are considered equivalent to zero for CEQA and District permitting purposes (SJVAPCD 2012b).

Local Policies and Regulations

The City of Modesto and Stanislaus County do not have any specific GHG policies applicable to the proposed project. Policies for Merced and San Joaquin Counties are not discussed because no GHG related activities and emissions would occur in these counties.

City of Turlock

The City of Turlock General Plan has the following applicable GHG policies:

> *8.2-a Reduce Greenhouse Gas Emissions.* Reduce greenhouse gas emissions to support statewide GHG reduction goals under the California Global Warming Solutions Act (AB 32).
>
> *8.2-b Decrease Vehicle-Miles Travelled.* Promote a broad range of transportation, land use, and site design measures that result in a decrease in the number of automobile trips and vehicle-miles traveled per capita.
>
> *8.2-c Facilitate Energy-Efficient Buildings.* Encourage energy efficiency through good urban design and site-planning practices, as well as through building design, maintenance and retrofit.
>
> *8.2-d Promote Energy Conservation.* Support understanding of the relationship between energy consumption, air quality, and greenhouse gases, and promote energy-saving practices.
>
> *8.2-e Reduce Waste.* Reduce per capita landfill waste generation by promoting reuse, recycling, and composting.
>
> *8.2-f GHG Emissions Reduction Implementation.* Within three years of General Plan adoption, prepare a strategic plan for reducing greenhouse gas emissions, focusing on technically and financially feasible implementation measures that can be taken by the City. The Plan will guide the City to lower emissions from its buildings, fleet, and operations.
>
> *8.2-n Wastewater and Water System Efficiency.* Maximize the efficiency of City-operated wastewater treatment, water treatment, pumping, and distribution equipment. This measure may be part of the GHG Emissions Reduction Plan described in 8.2-f.
>
> *8.2-o Outdoor Lighting.* Establish outdoor lighting standards to minimize energy use while ensuring appropriate light levels. Standards could include:
>
> - Photocells or astronomical time switches;
> - Directional and shielded LED lights;
> - Security lights with motion detectors;
> - Prohibition against continuous all-night outdoor lighting unless required for security reasons.

8.2-s Require Energy Efficiency for Projects Receiving Public Assistance. Require that projects receiving assistance from the City of Turlock, including but not limited to infrastructure projects and affordable housing, include energy efficiency measures beyond the minimum standards of Title 24.

8.2-t Encourage Solar Power Generation. Encourage the use of passive and active solar devices such as solar collectors, solar cells, and solar heating systems into the design of buildings and parking areas by participating in existing incentive programs and considering new incentives for Turlock property owners.

8.2-u Encourage Other Onsite Renewable Energy Systems. Encourage the installation of other renewable energy systems in new or existing development. Renewable power generation may count toward the Air District's proposed BPS for projects with systems capable of generating at least 2.5 percent of their energy need.

8.2-v Methane Capture. Produce energy through methane capture at the Regional Water Quality Control Facility. Explore opportunities to enhance waste-to-energy generation if feasible.

3.9.3 Impact Analysis/Environmental Consequences

Methodology for Analysis

This section evaluates whether construction and operation of the proposed project and its actions would result in significant impacts related to GHG emissions.

As required by SJVAPCD, the California Emission Estimator Model (CalEEMod) version 2013.2.2 was used to quantify GHG emissions from the proposed project construction and operation activities. CalEEMod incorporates numerous default assumptions and CARB emission factors for on-road and off-road vehicles (EMFAC 2013 and In-Use Off-Road Equipment Inventory Model 2011). Below is a brief summary of the CalEEMod site-specific inputs used to estimate emissions from the proposed project, which are the same as the assumptions used in the analysis of air quality impacts (see *Section 3.3, Air Quality*). Further CalEEMod inputs and outputs are available in **Appendix B**.

The proposed project alternatives are assumed to take approximately 1.5 years to construct from summer of 2016 through spring of 2018. Assumptions regarding construction are shown in **Table 3.3-5** in *Section 3.3, Air Quality*, and in **Appendix C**. In general, it was assumed that five construction crews were working simultaneously.

The equipment anticipated to be employed during each construction phase is shown in **Table 3.3-6 and 3.3-7** in *Section 3.3, Air Quality*. The equipment was mapped to an appropriate CalEEMod equipment type and default horsepower and load factors were applied unless it was mapped to a general equipment category, which used a typical equipment size that may be appropriate for the proposed project construction activities.

The number of worker and material hauling trips is shown in **Table 3.3-8** in *Section 3.3, Air Quality*. Worker trips were assumed to be 20 miles one-way and material hauling trips were assumed to be 30 miles one way.

Once the baseline construction emissions associated with the alternatives were estimated, mitigation options were evaluated to see if on-site mitigation would be possible to reduce emissions below the significance thresholds. The impact of requiring phased trips for all trucks hauling trench spoil and backfill, such that all trucks importing backfill material to the site would leave with excavated material that needs to be exported, was estimated. This significantly reduces the number of material hauling trips.

With respect to operational emissions, only sporadic vehicle trips would be needed for maintenance and inspection. Since the amount of trips is not known, but likely substantially less than the small project

threshold established by SJVAPCD, no operational emissions from vehicles were estimated. The pumps would be electricity-driven, and electricity was conservatively assumed to be supplied by Modesto Irrigation District. While the NVRRWP may use electricity from the Turlock Irrigation District, using the Modesto Irrigation District is conservative since it has a slightly higher GHG emissions per unit of electricity, and the electricity provider has not yet been determined. No criteria pollutants are associated with electricity use, but the indirect GHG emissions were estimated using CalEEMod. The single alignment alternative may also require an emergency generator at the pump station located at the Harding Drain Bypass Pipeline. This was not evaluated in CalEEMod since this a permitted stationary source and would undergo permitting procedures that are assumed to result in emissions below the significance thresholds.

Thresholds of Significance

Consistent with Appendix G of the *CEQA Guidelines* an greenhouse gas emissions impact would be considered significant if the project would:

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment.
- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing emissions of GHGs.

Construction emissions have been considered less than significant if GHG emissions are less than SJVAPCD's zero equivalency threshold of 230 metric tons of CO_2e per year. Construction emissions are typically amortized over the life of the project, which is assumed to be 40 years.

For operational emissions, SJVAPCD has adopted a Best Management Practice (BMP) threshold for GHG emissions based on an achievable-in-practice analysis of improvement over a business-as-usual scenario, or 29 percent improvement. However, at this time there is not an approved BMP for this type of project, nor has suitable data to establish a business-as-usual scenario been provided by the SJVAPCD. Therefore, the published California air district mass emissions thresholds were reviewed and considered in developing an appropriate threshold. Both Santa Barbara Air Pollution Control District and the South Coast Air Quality Management District have established a 10,000 metric ton CO_2e per year threshold for industrial sources. This is lower than the CEQ-suggested presumptive 25,000 metric tons of CO_2e emissions from a proposed action to trigger a quantitative analysis in NEPA documents. Thus, a 10,000 metric ton CO_2e per year threshold for operational sources seems appropriate.

The applicable plans and policies for operational-related emissions were determined to be CARB's Scoping Plan. Specifically, if a project activity does not conflict with CARB's GHG emission reduction policies, it would have a less than significant impact. For construction-related GHG emissions, the applicable significance threshold is compliance with the SJVAPCD's zero equivalency policy, which is considered to be consistent with CARB's Scoping Plan and associated regulations. The zero equivalency policy is used for construction emissions to designate the temporary and low level of emissions that when considered against the total GHG emissions emitted in California is considered *de minimis* and equivalent to no substantial long-term change in the overall amount of emissions.

Impacts and Mitigation Measures

Impact GHG-1 Construction Emissions of GHGs

Estimates of construction emissions associated with the alternatives were estimated using CalEEMod with assumptions specified above and in **Appendix B**. The total construction emissions are then amortized over a 40-year project life.

Combined Alignment Alternative

Under standard equipment assumptions including unphased material hauling trips, the anticipated construction emissions associated with this alternative are shown in **Table 3.9-2**. The amortized construction emissions would be below the SJVAPCD zero equivalency threshold of 230 metric tons of CO2e per year. Thus, the construction emissions associated with the Combined Alignment Alternative would have a less than significant impact.

Table 3.9-2: Combined Alignment Alternative GHG Construction Emissions

Scenario	GHG Emissions (metric tons CO2e)	
	Unphased Truck	Phased Truck
Total Construction Emissions	2,175	1,830
Amortized Emissions	54.4	45.8

Notes:
Emissions are amortized over an assumed 40 year project life.
Source: **Appendix B**.

Table 3.9-2 also shows the construction GHG emissions that would be a result of phased material hauling truck trips since this is an option presented in *Section 3.3, Air Quality*, as a potential mitigation measure for criteria pollutant emissions. Phased truck emissions would result in an overall reduction in GHG emissions compared to unphased truck trips of 15.8 percent. Because this scenario would further reduce emissions below the zero equivalency threshold, impacts under this scenario would also have a less than significant impact.

Separate Alignment Alternative

Under standard equipment assumptions including unphased material hauling trips, the anticipated construction emissions associated with this alternative are shown in **Table 3.9-3**. The amortized construction emissions would be below the SJVAPCD zero equivalency threshold of 230 metric tons of CO2e per year. Thus, the construction emissions associated with the combined alignment alternative would have a less than significant impact.

Table 3.9-3: Separate Alignment Alternative GHG Construction Emissions

Scenario	GHG Emissions (metric tons CO2e)	
	Unphased Truck	Phased Truck
Total Construction Emissions	3,396	2,869
Amortized Emissions	84.2	71.7

Notes:
Emissions are amortized over an assumed 40 year project life.
Source: **Appendix B**.

Table 3.9-3 also shows the construction GHG emissions that would be a result of phased material hauling truck trips since this is an option presented in Section 3.3 Air Quality, as a potential mitigation measure for criteria pollutant emissions. Phased truck emissions would result in an overall reduction in GHG emissions compared to unphased truck trips of 14.8 percent. Because this scenario would further reduce emissions below the zero equivalency threshold, impacts under this scenario would also have a less than significant impact.

PID Conveyance Alternative

Because this alternative would require somewhat less construction than the Combined and Separate Alignment Alternatives, it is expected that construction emissions would also be below the SJVAPCD zero equivalency threshold of 230 metric tons of CO2e per year. Thus, the construction emissions associated with this alternative would be less than significant.

No Action Alternative

Under the no action alternative, recycled water would continue to be discharged to the San Joaquin River and or applied to land and there would be no construction required, therefore no construction emissions and no impact on GHG emissions.

Significance Determination before Mitigation

Less than significant for all action alternatives.

Mitigation Measures

No mitigation required.

Impact GHG-2 Operational Emissions of GHGs

Under the proposed project, only occasional trips would be needed for pipeline maintenance and inspection; thus their GHG emissions were not quantified. In addition, the GHG emissions associated with periodic testing and maintenance of any emergency generators was not quantified as it was also assumed to be minimal. The main source of GHG emissions during the proposed project operation would be from the electricity used to run the pumps that would transport the water to the DMC. The electricity used by the pumps would result in indirect GHG emissions and was quantified using CalEEMod with the details contained in **Appendix B**.

Combined Alignment Alternative

Based on assuming a total of 15,442 megawatt-hours of electricity used per year, the resulting GHG emissions would be 5,855 metric tons of CO_2e per year. This is below the 10,000 metric ton CO_2e per-year threshold for industrial sources, and therefore emissions would be less than significant. Furthermore, this calculation would be an overestimate for future years, since the renewable portfolio standards require emissions associated with electricity to decrease with the incorporation of up to 33 percent renewable energy sources which have zero GHG emissions.

Separate Alignment Alternative

Based on assuming a total of 17,898 megawatt-hours of electricity used per year, the resulting GHG emissions would be 6,786 metric tons of CO_2e per year. This is below the 10,000 metric ton CO2e per year threshold for industrial sources and therefore emissions would be less than significant.

PID Conveyance Alternative

Based on assuming a total of 20,063 megawatt-hours of electricity used per year, the resulting GHG emissions would be 7,607 metric tons of CO_2e per year. This is below the 10,000 metric ton CO2e per year threshold for industrial sources and therefore emissions would be less than significant.

No Action Alternative

Under the no action alternative, recycled water would continue to be discharged to the San Joaquin River or applied to land. There would be no change in operational emissions from current practices and thus no impact on GHG emissions.

Significance Determination before Mitigation

Less than significant for all action alternatives.

Mitigation Measures

No mitigation required.

Impact GHG-3 Consistency with applicable GHG reduction plans

The proposed project would not conflict with any regulations or policies in CARB's Scoping Plan. Furthermore, the proposed project would be consistent with CARB's First Scoping Plan Update that suggests the need for future infrastructure planning of water resources to ensure adequate supplies during droughts. One of the main goals of the proposed project is to utilize recycled water that is currently discharged to the river to provide irrigation water to areas that are in need of water and to protect wildlife refuges. The GHG emissions would be below significance thresholds, as the project would use electric pumps, with the exception of necessary emergency backup generators. The indirect emissions associated with the electricity use of the pumps would decrease over time as a result of existing regulations that require the electricity suppliers to increase the percentage of renewable electricity generating sources to 33 percent by 2020.

Combined Alignment Alternative

There would be no impact.

Separate Alignment Alternative

There would be no impact.

PID Conveyance Alternative

There would be no impact.

No Action Alternative

Under the No Action Alternative, recycled water would continue to discharge to the San Joaquin River. There would be no change in emissions from current practice and current practices, which are consistent with CARB's Scoping Plan, and as a result, there would be no impact. However, the No Action Alternative does not move toward ensuring adequate water supplies during droughts, which was identified in the First Scoping Plan Update as a future direction for GHG and climate adaptation policies and regulations.

Significance Determination before Mitigation

No impact for all action alternatives.

Mitigation Measures

No mitigation required.

Cumulative Impacts

Because GHG emissions and their contribution to global climate change is a global issue, the criteria above address the cumulative impacts of the project's contributions to GHG emissions. As noted above, the SJVAPCD's Climate Change Action Plan was developed to reduce the impacts of project specific GHG emissions on global climate change. Because emissions would not exceed the applicable SJVAPCD significance thresholds for GHG emissions, the project's GHG emissions are not considered to be cumulatively considerable.

3.9.4 References

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3.10 Hazards and Hazardous Materials

This section presents the physical and regulatory setting for hazards and hazardous materials surrounding the proposed project. The impact analysis considers the potential for the NVRRWP to release hazardous materials into the surrounding environment at levels that would create substantial risk to neighboring areas.

3.10.1 Environmental Setting/Affected Environment

This section describes the environmental setting for current hazards and hazardous materials within the study area, which includes the proposed project site and adjacent areas.

Known Contamination Sites

Two online databases were searched for known contamination sites within the study area, including EnviroStor (State Department of Toxic Substances [DTSC] Hazardous Waste and Substances Site List) and GeoTracker (State Water Resources Control Board).

The EnviroStor database identifies sites that have known contamination or sites for which there may be reasons for further investigation. Specifically, it lists the following site types: Federal Superfund sites (National Priority List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. Sites that are in the Hazardous Waste and Substances Site List - Site Cleanup (Cortese List)[1] are also identified.

The GeoTracker is an online tool that provides regulatory data regarding sites that impact groundwater, particularly those that require groundwater cleanup, as well as permitted facilities such as those operating underground storage tanks and land disposal sites (SWRCB 2010).

A search of these two databases shows four known contamination sites within 1,000 feet of the proposed project alternative alignments. These sites are detailed below.

PRC Patterson, Inc. (CAD083166728) (T0609900147)

The PRC (Petroleum Recycling Corporation) Patterson site is a 10-acre triangular lot located at 13331 North Highway 33. The northern pipeline alignment runs west along Lemon Ave where it briefly heads south on Highway 33 before turning west again on Zacharias Road. The site is located roughly 0.10 miles northwest of the corner of Lemon Ave and Highway 33. The site was home to the Enviropur West Oil Recycling Facility, formerly known as the Petroleum Recycling Corporation Patterson facility, which was an oil recycling facility and hazardous waste generator from the early 1970s until 1996, when the facility was abandoned due to bankruptcy (DTSC 2014). Prior to the 1970s, the site was used as a pump station for transporting heavy crude oil from Bakersfield to the Bay Area, at which time the site managed an estimated 29 aboveground storage and process tanks. The site is currently owned by the Balock Family Industrial/Commercial Property Trust. Verification monitoring was being conducted in 2003 (SWRCB 2014). Currently, the site is undergoing closure activities, and DTSC has requested that the owner provide a Corrective Action and a Closure and Post-Closure Plan (DTSC 2014).

AL Castle, Inc. (60001557)

The site is located at 1607 W. Marshall Road and is directly adjacent to the southern pipeline alignment as it runs west along W. Marshall Road. An agricultural company, AL Castle, Inc. provided agricultural spraying services for herbicides, pesticides, and fertilizers (DTSC 2014). The site was used for storage of farm machinery and spraying equipment from the 1950s to the late 1980s. There is potential soil and surface and groundwater contamination from truck washing activities, which would have generated runoff

[1] Cortese List sites are those that are compiled pursuant to Government Code Section 65962.5.

water potentially containing pesticides, herbicides, and fertilizers. This runoff was drained into a ditch that carried the water to an unlined settling pond south of the site. From the settling pond, the water was pumped into the Delta-Mendota Canal. In 1989, AL Castle's discharge permit was revoked by the Bureau of Reclamation and the pump was locked (DTSC 2014). As of June 27, 2012, the site is considered inactive and further evaluation by the DTSC was recommended. Thus, the extent of the contamination is not known.

De Lash Enterprises (T0609939467)

This site is located at 16561 SR 33, and is adjacent to the pipeline alignment for the PID Conveyance alternative where it crosses SR 33. The site was formerly a trucking yard that operated a small gas station. Three underground storage tanks were removed from the site, but it was subsequently determined that there was residual contamination of soil and groundwater. The site has been cleaned up and the case has been closed since 2009 (SWRCB 2014).

Campbell Ranch (T0609991946)

This site is located at 16521 Ward Avenue, and is adjacent to the portion of the PID Conveyance Alternative pipeline alignment where it runs along Ward Avenue. The site is an open remediation case with known contamination from fuel or other petroleum hydrocarbons affecting groundwater. Although the leak was stopped in 1990, at which time contaminated soils were excavated, the site is still identified as active (SWRCB 2014).

Wildland Fire

The proposed project is in an area designated for agricultural use by Stanislaus County. Fires within Stanislaus County are generally limited to the foothills in the very eastern and western portions of the County (Stanislaus County 1994). The proposed project is located in a Locally Responsible Area (LRA), indicating that neither the state nor the federal government is responsible for fire protection in that area (for more information on fire districts within the region, please see Chapter 3.16, Public Services and Utilities). California Department of Forestry and Fire Protection (CAL FIRE) has developed a Fire Hazard Severity Zone ranking system that predicts the likelihood of an area burning. The model is based on vegetation, topography, weather, crown fire potential, and ember production and movement. Areas identified as LRA are mostly designated "LRA Unzoned" with small pockets designated LRA Moderate Fire Hazard Severity Zone, generally south of West Main Avenue and west of South Carpenter Road and around the San Joaquin River in that area (CAL FIRE 2007a).

The area to the west of Interstate 5 is designated as a State Responsibility Area (SRA), indicating that CAL FIRE is responsible for fire management in that area. Within this SRA, the areas west of Interstate 5, adjacent to the proposed project are designated as Medium and High Fire Hazard Severity Zones (CAL FIRE 2007b). The closest Very High Fire Hazard Severity Zone is located approximately six miles to the northwest of the proposed pipeline. While fires have, in the past been as close as 1 mile from the study area, there have been no wildfires reaching the study area (Stanislaus County 2010). The Jennings Plant pump station is located 12 miles away from the nearest Very High Fire Hazard Severity Zone. In addition, past wildfires have not been within 5 miles from the pump station.

3.10.2 Regulatory Framework

Hazardous materials and wastes can result in public health hazards if released to soil, groundwater, or air. Hazardous materials as defined in Section 25501(o) of the California Health and Safety Code are materials that, because of their "quantity, concentration, or physical or chemical characteristics, pose a significant present or potential hazard to human health and safety or to the environment if released to the workplace or environment." Hazardous materials have been and are commonly used in commercial, agricultural, and industrial applications, as well as to a limited extent in residential areas.

A waste is any material that is relinquished, recycled, or inherently waste-like. CCR Title 22 Section 66261.1, et seq. contains regulations for the classification of hazardous wastes. Article 3 criteria classify waste as hazardous if it is toxic (causes human health effects), ignitable (has the ability to burn), corrosive (causes severe burns or damage to materials), or reactive (causes explosions or generates toxic gases). Article 4 also lists specific hazardous wastes, while Article 5 identifies specific waste categories, including Resource Conservation and Recovery Act (RCRA) hazardous wastes, non-RCRA hazardous wastes, extremely hazardous wastes, and special wastes. If improperly handled and released to soil, groundwater, or air (in the form of vapors, fumes, or dust), hazardous materials and wastes can result in public health hazards.

This section describes laws and regulations that may apply to the proposed project.

Federal Policies and Regulations

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

CERCLA, also referred to as the Superfund law, regulates the potential for liability for cleanup of hazardous substances, provides for defense against liability, identification of contaminated sites, defines hazardous substances, petroleum products, and petroleum exclusions. The Superfund Amendments and Reauthorization Act (SARA), includes emergency planning and community right-to-know. Under CERCLA, facilities must report where toxic chemicals are transferred, chemical-specific information, and supplemental information, along with identification information for their facility to the U.S. Environmental Protection Agency (EPA). Hazardous substances must be reported, and releases to the environment accounted for.

Resource Conservation and Recovery Act (RCRA)

RCRA regulates potential health and environmental problems associated with solid waste hazards and nonhazardous waste. RCRA defines solid waste as garbage or refuse, sludge from wastewater treatment plant, water supply treatment plant, or air pollution control facility, and other discarded materials. Solid waste can be either hazardous or non-hazardous. Hazardous waste is waste that burns readily, is corrosive, or reactive, or if it contains certain amounts of toxic chemicals, or has been included on the U.S. EPA's list of hazardous wastes. RCRA regulates the disposal of waste and aims to reduce waste generation. It restricts which facilities can receive hazardous wastes and regulates facilities to ensure proper handling of materials.

Emergency Planning and Community Right-To-Know Act (EPCRA)

EPCRA was passed in 1986 and requires federal, state, and local governments to create chemical emergency response plans for releases of hazardous substances. It also requires reporting on hazardous and toxic chemicals to increase awareness and access to information on chemical and individual facilities. It requires that facilities report accidental releases of certain chemicals and hazardous substances, and provide such information to the public. Facilities must create and make available Material Safety Data Sheets (MSDS) that describe the chemicals in question and health effects associated with them. Chemical inventories must also be reported if they require an MSDS.

Hazardous Materials Worker Safety Requirements

The federal Occupational Safety and Health Administration (OSHA) is the federal agency responsible for ensuring worker safety. The federal regulations for worker safety are contained in CFR Title 29, as authorized in the Occupational Safety and Health Act of 1970; these regulations provide standards for safe workplaces and work practices, including those relating to hazardous materials handling.

Preliminary Remediation Goals

USEPA has published screening levels, referred to as Regional Screening Levels (RSLs), for the evaluation of chemicals commonly found in soil or groundwater where a release of hazardous materials has occurred (USEPA 2014). For an industrial worker, these screening levels are conservative estimates of safe levels of a chemical that a worker could be exposed to in soil and groundwater. If the concentration of a chemical in the soil or groundwater is below the RSL, then it can be assumed that the chemical would not pose a health risk to the worker. Screening levels would generally be lower for industrial workers than construction workers because the industrial worker would be exposed to the hazard over a lifetime while the construction worker would only be exposed for the duration of construction. Therefore, safe levels of chemicals in soil and groundwater would generally be higher for construction workers than industrial workers.

State Policies and Regulations

California Health and Safety Code

The California Health and Safety Code contains statewide regulations designed to protect public health and safety. Sections of the state code relevant to the proposed Project/Action include the Hazardous Materials and the Hazardous Waste and Substances Site List (Cortese List), which is developed under Section 65962.5 of the California Government Code. The list is compiled and maintained by the DTSC under the California EPA. The Cortese List is a list of all sites identified as having hazardous waste releases.

Facilities that handle, store, use, treat, dispose of, or generate hazardous materials are required to create hazardous-waste management programs under Division 20, Chapter 6.5, section 25100 et seq. Facilities that generate hazardous wastes in excess of 26,400 pounds per year, or extremely hazardous wastes in excess of 26.4 pounds per year, must adhere to California Health and Safety Code Section 25244.12 et seq. This section of the code requires facilities to determine the types and amounts of wastes generated, identify procedures to reduce waste generation, develop written documentation that addresses waste reduction, develop a source-reduction evaluation review and plan, prepare a plan summary and hazardous waste management report, and a report summary. Hazardous materials handling, reporting requirements, and local agency surveillance programs are regulated under the California Health and Safety Code, Section 25500 et seq.

Local Policies and Regulations

Stanislaus County General Plan

The Stanislaus County General Plan (Stanislaus County 1994) guides development for the County with a 20-year planning horizon. The following policy in the Stanislaus County General Plan, Safety Element would apply to the project:

> *Policy Thirteen:* The Department of Environmental Resources shall continue to coordinate efforts to identify locations of hazardous materials and prepare and implement plans for management of spilled hazardous materials as required.

Stanislaus County Hazardous Materials Business Plan

As required under the California State Health and Safety Code, businesses that use, handle, or store a hazardous material or an extremely hazardous material are required to submit Hazardous Materials Business Plans to Stanislaus County (Stanislaus County 2014a). Business Plans contain information on the location, type, quantity, and health risks of hazardous materials stored, used, or disposed of within the County. The Hazardous Materials Division of the Department of Environmental Resources at Stanislaus County performs routine inspections at businesses required to submit Business Plans to ensure

compliance with existing laws and regulations, to identify existing safety hazards, and to suggest preventative measures.

The Hazardous Materials Business Plan must be recertified every year and a copy of the current certification must be kept on the business site (Stanislaus County 2014a). The County also must be notified within 30 days if there is any increase in quantity of a hazardous material at the business, if there is any handling of a previously undisclosed hazardous material, if there is any change in the storage, location or use of hazardous materials, or if there is any change to the business details, including a change in the site map.

City of Modesto Urban Area General Plan

The City of Modesto Urban Area General Plan serves as a blueprint for future growth within the City. The Plan outlines policies that focus on a community vision (City of Modesto 2008). The following policy in the Urban Area General Plan relating to hazards and hazardous materials would apply to the project:

> *Hazardous Materials Management Policies (a)*: The City shall comply with all existing federal and state laws that regulate the generation, transportation, storage, and disposal of hazardous materials.
>
> *Hazardous Materials Management Policies (c)*: In the event that site inspection or construction activities uncover chemical contamination, underground storage tanks, abandoned drums, or other hazardous materials or wastes at a parcel, the inspection report preparer shall so notify the City. The City shall notify the County Health Services Department. Under the direction of these agencies, a site remediation plan shall be prepared by the project applicant.
>
> The plan would (1) specify measures to be taken to protect workers and the public from exposure to potential site hazards and (2) certify that the proposed remediation measures would clean up the wastes, dispose the wastes, and protect public health in accordance with federal, state, and local requirements. Permitting or work in the areas of potential hazard shall not proceed until the site remediation plan is on file with the City.
>
> If a parcel is found to be contaminated to a level that prohibits the proposed use, the potential for reduction of the hazard should be evaluated. Site remediation is theoretically capable of removing hazards to levels sufficiently low to allow any use at the site. In practice, both the technical feasibility of the remediation and its cost (financial feasibility) should be evaluated in order to determine the overall feasibility of locating a specific use on a specific site. In some cases, it may require restriction to industrial use or a use that involves complete paving and covering of the parcel.
>
> In accordance with OSHA requirements, any activity performed at a contaminated site shall be preceded by preparation of a separate site health and safety plan (prepared by the project applicant and filed with the City) for the protection of workers and the public. All reports, plans, and other documentation shall be added to the administrative record.
>
> *Hazardous Materials Management Policies (d)*: For each specific project that would generate hazardous waste, the City shall require as a condition of building permit and/or business license approval that the project sponsor prepare a hazardous material transportation program. The transportation program shall identify the location of the new facility or use and designate either (1) specific routes to be used for transport of hazardous materials and wastes to and from the facility, or (2) specific routes to be avoided during transport of hazardous materials and wastes to and from the facility. Routes would be selected to minimize proximity to sensitive receptors to the greatest practical degree. Passage through residential neighborhoods should be minimized,

and parking of waste haulers on residential streets should be prohibited. The City Fire Department shall review and approve the applicant's hazardous materials transportation program or, working with the applicant, modify it to the satisfaction of both parties.

Fire Hazard Policies, Peak Load Water Supply: The City shall ensure that adequate water fire-flows are maintained throughout the City and shall regularly monitor fire-flows to ensure adequacy. New development shall comply with the minimum fire-flow rates, as presented in Appendix B of the California Fire Code.

Fire Hazard Policies, Miscellaneous (3): Require all new development to have adequate water to meet the established fire-flow standards.

3.10.3 Impact Analysis/Environmental Consequences

Methodology for Analysis

This section evaluates whether construction and operation of the facilities associated with the proposed project would result in significant hazards and hazardous materials impacts. Impacts are evaluated based on the known potentially hazardous materials that would be used or stored on site during construction and operation, potential for accidental hazardous substance release, and presence of other health-threatening factors in the proposed project vicinity.

Thresholds of Significance

Consistent with Appendix G of the *CEQA Guidelines,* a hazard or hazardous materials impact would be considered significant if the project would:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;
- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school;
- Be located on a site which is included on a list of hazardous materials site compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment;
- For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, result in a safety hazard for people residing or working in the project area;
- For a project within the vicinity of a private airstrip, result in a safety hazard for people residing or working in the project area;
- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan;
- Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

Criteria Requiring No Further Evaluation

Criteria listed above that are not applicable to actions associated with the proposed project are identified below along with a supporting rationale as to why further consideration is unnecessary and a no-impact determination is appropriate.

- *Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials* – The proposed project would not involve the routine transport, use or disposal of hazardous materials. Thus, the proposed project would not create any significant hazards to the public or the environment.
- *Handling and use of hazardous substances within one quarter-mile of an existing or proposed school*– There are no schools or proposed schools located within one quarter-mile of the proposed project. The closest school, Northmead Elementary School, is located approximately 1.25 miles south of the northern pipeline alignment in the City of Patterson. Patterson High School is located 1.5 miles south of the northern pipeline alignment. Thus, there would be no impact and no further evaluation is required.
- *Be located on a site which is included on a list of hazardous materials site compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment* – The proposed project is not located on a site included on a list of hazardous materials site compiled pursuant to Government Code Section 65962.5 (Cortese List). Three Cortese List sites are located within Stanislaus County, and the nearest site to the project area (Gallo Glass – Sisk Ranch) is located more than 4 miles northeast of the eastern extent of the northern pipeline alignment. As such, the proposed project would not create a significant hazard to the public or the environment.
- *Be located within an airport land use plan or within two miles of a public airport and result in a safety hazard for people residing or working in the project area, or for a project within the vicinity of a private airstrip, result in a safety hazard for people residing or working in the project area* – The proposed project is not located within an airport land use plan, nor is it within two miles of a public airport. The Crows Landing Airport, a private landing facility, is located roughly a mile south of the southern pipeline alignment that runs west along East Marshall Road. This facility was formerly named the Naval Auxiliary Landing Field Crows Landing when it was operated by the United States Navy. The parcels undergoing remediation activities are owned by NASA, but property ownership is being transferred to Stanislaus County once cleanup of a parcel is complete (DTSC 2014). Due to the distance of the airstrip from proposed construction areas and the nature of construction within road rights-of-ways, project construction would not result in safety hazards for people residing or working in the project area.

Impacts and Mitigation Measures

Impact HAZ-1 Create a Hazard through Reasonably Foreseeable Upset and Accident Conditions Involving Release of Hazardous Materials into the Environment

Combined Alignment Alternative

Construction of the proposed project could create a hazard to the public or the environment through upset and accident conditions involving the release of hazardous materials used in construction, which include diesel fuel and minor amounts of paints, fuels, solvents and glues. These materials would generally be used in excavation equipment, generators, and other construction equipment and would be contained within vessels engineered for safe storage. These materials would be stored at the construction sites. Where construction activities are adjacent to waterways (i.e., San Joaquin River and the DMC), accidental release of hazardous materials could degrade water quality. Thus, impacts associated with accidental release of hazardous materials are considered potentially significant. **Mitigation Measure HAZ-1a** would reduce the risk of this kind of exposure to less than significant.

The PRC Patterson site is a known hazardous materials site located at 13331 North Highway 33, roughly 0.10 miles to the northwest from proposed project at the corner of Lemon Ave and Highway 33. Groundwater within the underlying Delta-Mendota sub-basin has historically flowed northwest, but more

recent data indicates groundwater flowing to the north and eastward (California Department of Water Resources [DWR] 2006). Because this flow is away from the proposed project area, risks associated with uncovering contaminated soil or contaminated groundwater are not anticipated and the potential for accidental release of hazardous materials into the environment and subsequent exposure to the public is considered less than significant.

Separate Alignment Alternative

In addition to the impacts listed under the Combined Alignment Alternative, the southern pipeline is located 0.10 miles from the AL Castle, Inc. site. The site is located on the west side of the DMC, southwest of where the proposed project would discharge to the DMC. Groundwater within the region flows north and eastward (DWR 2006). As such, there is a potential for encountering contaminated groundwater during construction activities if dewatering is needed. Contaminated soil may also be present depending on the extent of past contamination. In such an event, contaminated material would need to be stored for classification, transported, and properly disposed. **Mitigation Measure HAZ-1b** would reduce the risk of an accidental release of hazardous materials to less than significant.

PID Conveyance Alternative

This alternative would have the same potential for release of hazardous materials during construction as described above for the Combined Alignment Alternative. **Mitigation Measure HAZ-1a** would reduce the risk of this kind of exposure to less than significant.

According to the Geotracker database (SWRCB 2014), there are two known contamination sites within 1,000 feet of the pipeline alignment for the PID Conveyance Alternative. De Lash Enterprises, located at 16561 Highway 33, was the site of a leaking underground fuel tank, which caused contamination of soil and groundwater. The site has been cleaned up and the case has been closed since 2009. Campbell Ranch, located at 16521 Ward Avenue, is another site of a known leak of fuel or other petroleum hydrocarbons affecting groundwater. This case is still open, and the site is on a parcel that is immediately adjacent to the pipeline alignment. This alternative thus also has the potential for uncovering contaminated soil or groundwater during construction. **Mitigation Measure HAZ-1b** would reduce the risk of an accidental release of hazardous materials to less than significant.

No Action Alternative

If no action were taken, there would be no hazardous materials impacts within the study area.

Significance Determination before Mitigation

Potentially significant for all action alternatives.

Mitigation Measures

Mitigation Measure HAZ-1a: Hazardous Materials Management and Spill Prevention Control Plan (Alternatives 1, 2 and 3)

Prior to the start of construction, the construction contractor shall be required to prepare a Hazardous Materials Management Spill Prevention and Control Plan that includes a project-specific contingency plan for hazardous materials and waste operations. The Plan shall be applicable to construction activities, and shall establish policies and procedures according to applicable codes and regulations, including but not limited to the California Building and Fire Codes, and federal and California Occupational Safety and Health Administration (OSHA) regulations. Elements of the Plan shall include, but not be limited to, the following:

- A discussion of hazardous materials management, including delineation of hazardous material storage areas, access and egress routes, waterways, emergency assembly areas, and temporary hazardous waste storage areas;

- Notification and documentation of procedures; and
- Spill control and countermeasures, including employee spill prevention/response training.

Mitigation Measure HAZ-1b: Conduct Phase I Study along Pipeline Segments (Alternatives 2 and 3)

Prior to the start of construction, a Phase I hazardous waste/hazardous materials study for soil and groundwater contamination shall be completed for the Separate Alignment Alternative in the area where the southern pipeline alignment would connect with the DMC, and for the PID Conveyance Alternative, along Bartch and Ward Avenues. The recommendations set forth in the Phase I assessment shall be implemented to the satisfaction of applicable agencies before construction begins. If Phase I assessments indicate the potential for contamination within the construction zone of the pipelines, Phase II studies shall be completed before construction begins. Phase II studies will include soil and groundwater sampling and analysis for anticipated contaminants. The Phase II sampling is intended to identify how to dispose of any potentially harmful material from excavations, and to determine if construction workers need specialized personal protective equipment while constructing the pipeline through that area. If soil or groundwater contaminated by potentially hazardous materials is exposed or encountered during construction that was not identified in the Phase I assessment, the appropriate hazardous materials agencies will be notified.

Significance Determination after Mitigation

Less than significant.

Impact HAZ-2 Expose People or Structures to a Significant Risk of Loss, Injury or Death Involving Wildland Fires

Combined Alignment Alternative

The proposed project is located in an agricultural area and is not considered wildlands. Agricultural areas that have been designated by CALFIRE within the LRA area exist within the project area in the vicinity of West Main Avenue and South Carpenter Road and along San Joaquin River. Wildlands with Fire Hazard Severity Zone rating of Medium and Very High are located at least 0.5 miles west of the proposed project area, on the west side of Highway 5. The use of spark-producing construction machinery adjacent to Medium and Fire Hazard Severity Zones could potentially create hazardous fire conditions that could increase the risk of exposing people or structures to a significant risk of loss, injury or death. As such, construction of the proposed project would result in a potentially significant impact. **Mitigation Measure HAZ-2** would reduce this potential risk to less than significant.

Once construction is complete, maintenance activities would not be expected to pose a high risk of fire. Pipelines would be buried and would not be exposed to fire and the risk of damage will be less than significant.

Separate Alignment Alternative

Impacts would be the same as the Combined Alignment Alternative.

PID Conveyance Alternative

This alternative is also is located in an agricultural area and is not considered wildlands. Impacts would be the same as the Combined Alignment and Separate Alignment Alternatives, and would be less than significant with mitigation.

No Action Alternative

If no action were taken, there would be no wildland fire-related impacts within the study area.

Significance Determination before Mitigation

Potentially significant for all action alternatives.

Mitigation Measures

Mitigation Measure HAZ-2: Prevention of Fire Hazards (Alternatives 1, 2 and 3)

During construction of the proposed project, the construction contractor shall require staging areas, welding areas, or areas slated for construction be cleared of dried vegetation or other materials that could ignite. Construction equipment that includes a spark arrestor shall be maintained in good working order. In addition, construction crews shall have a spotter during welding activities to look out for potentially dangerous situations, such as accidental sparks. Other construction equipment shall be kept in good working order and used only within cleared construction zones. During construction of the proposed project, contractors shall require vehicles and crews working at the project site to have access to functional fire extinguishers.

Significance Determination after Mitigation

Less than significant.

Impact HAZ-3 Conflict with Any Adopted Emergency Response Plan or Emergency Evacuation Plan

Combined Alignment Alternative

The proposed project would not conflict with Stanislaus County's Multi-Jurisdictional Hazard Mitigation Plan. Goals of the Plan include: "minimizing the effects of hazardous conditions that might cause loss of life and property; reducing the economic impact of wildfires; promoting a sustainable economy; and increasing public preparedness for disasters." Objectives include ensuring that "future growth shall not exceed the capacity to provide services such as water and public safety" and to "discourage development in areas susceptible to wildfire." With implementation of mitigation measures identified above, the proposed project would not cause loss of life and property or economic impacts associated with hazardous conditions. As such, impacts are considered less than significant with mitigation measures HAZ-1a, HAZ-1b, and HAZ-2. Long-term operation of the project would not result in any hazards that would conflict with the Multi Multi-Jurisdictional Hazard Mitigation Plan because this project would only involve conveyance and discharge of recycled water to the DMC.

Refer to *Section 3.19, Transportation*, Impact TR-3, for a discussion of impacts associated with the potential for construction to interfere with the accessibility of roadways to emergency vehicles. Mitigation Measure TR-1 would reduce impacts associated with interference with emergency access and circulation to less than significant.

Separate Alignment Alternative

Impacts would be the same as Combined Alignment Alternative.

PID Conveyance Alternative

Impacts would be the same as Combined Alignment and Separate Alignment Alternatives.

No Action Alternative

If no action were taken, there would be no emergency response plan conflicts.

Significance Determination before Mitigation

Potentially Significant for all action alternatives.

Mitigation Measures

See **Mitigation Measures HAZ-1, HAZ-1a, and HAZ-2** above.

Significance Determination after Mitigation

Less than significant.

Cumulative Impacts

The geographic scope of potential cumulative impacts related to hazards and hazardous materials is the project site and immediate surrounding area. There are three relevant projects within the vicinity of the proposed project that may contribute to cumulative impacts:

- Jennings Treatment Plant Phase 2 Upgrades: increase tertiary treatment capacity by 12.6 mgd
- West Main Improvement Project: widen West Main Ave to 3 lanes from the San Joaquin River to Crows Landing Road (Stanislaus County Department of Public Works 2011);
- StanCOG South Corridor Study: study potential alignments and corridor options for an expressway from the City of Turlock on the east to I-5 on the west (Stanislaus County Department of Public Works 2011).

Cumulative projects would use hazardous materials during construction activities and thus could result in similar impacts associated with the accidental release of chemicals and exposure to public and the environment. In addition, construction could overlap and thus increase the risk of hazards. However, with the implementation of **Mitigation Measures HAZ-1a**, **HAZ-1b** and **HAZ-2,** the project's contribution to these cumulative impacts would not be cumulatively considerable. Thus, the project's contribution to cumulative impacts would be less than cumulatively significant.

3.10.4 References

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3.11 Hydrology and Water Quality

This section presents the physical and regulatory setting for hydrology and water quality for the proposed project. The impact analysis considers the potential for the proposed project to result in excess surface runoff or flooding, exceed water quality standards, or interfere with groundwater recharge.

The following appendices support this section:

- **Appendix G**: Evaluation of NVRRWP Impact on Groundwater

3.11.1 Environmental Setting/Affected Environment

The following sections describe the environmental setting for hydrology and water quality in proximity to the project site. For the purposes of this section, the "Study Area" refers to the potential footprint of the action alternatives including all construction areas, staging areas, access roads, and areas that would be temporarily or permanently disturbed.

Hydrology

The proposed project is located in the San Joaquin Valley, which is characterized by cool, wet winters and dry, warm summers. The majority of the annual precipitation occurs from December through April, with approximately 11 inches of rainfall per year.

Surface Water

The project area is located within the San Joaquin River Basin (Basin). The Basin covers 15,880 square miles, with its major river systems consisting of the San Joaquin River and its larger tributaries, the Cosumnes, Mokelumne, Calaveras, Stanislaus, Tuolumne, Merced, Chowchilla, and Fresno rivers (RWQCB, 2011). The surface water bodies potentially affected by the proposed project include the San Joaquin River, the DMC, and the San Luis Reservoir.

San Joaquin River

The 366-mile San Joaquin River long river starts in the high Sierra Nevada, and flows in a mostly northerly direction to the Delta. As discussed in *Chapter 1, Introduction,* Modesto's Jennings Wastewater Treatment Plant (Jennings Plant) and the City of Turlock's Regional Water Quality Control Facility (RWQCF) both discharge treated effluent to the San Joaquin River. Currently, the Turlock RWQCF discharges to the San Joaquin River via the Harding Drain Bypass Pipeline, a single source pipeline owned by the City of Turlock. Discharge via the Harding Drain Bypass Pipeline began on or about October 8, 2014, in accordance with the City of Turlock's NPDES permit requirements.

Figure 3.11-1 below shows a schematic of the San Joaquin River including inflows, outflows and monitoring points. The Vernalis gage and the Newman gage are the most important gages in relation to the proposed project. With respect to the Jennings Plant and the City of Turlock RWQCF, the Vernalis gage is downstream and the Newman gage is upstream. The Crows Landing gage is also upstream of both treatment plants but it has a more limited data history than the Newman gage. **Figure 3.11-2** shows monthly flow data for the San Joaquin River as measured at the Vernalis gage.

Figure 3.11-1: Schematic of San Joaquin River Inflows, Outflows and Monitoring Points

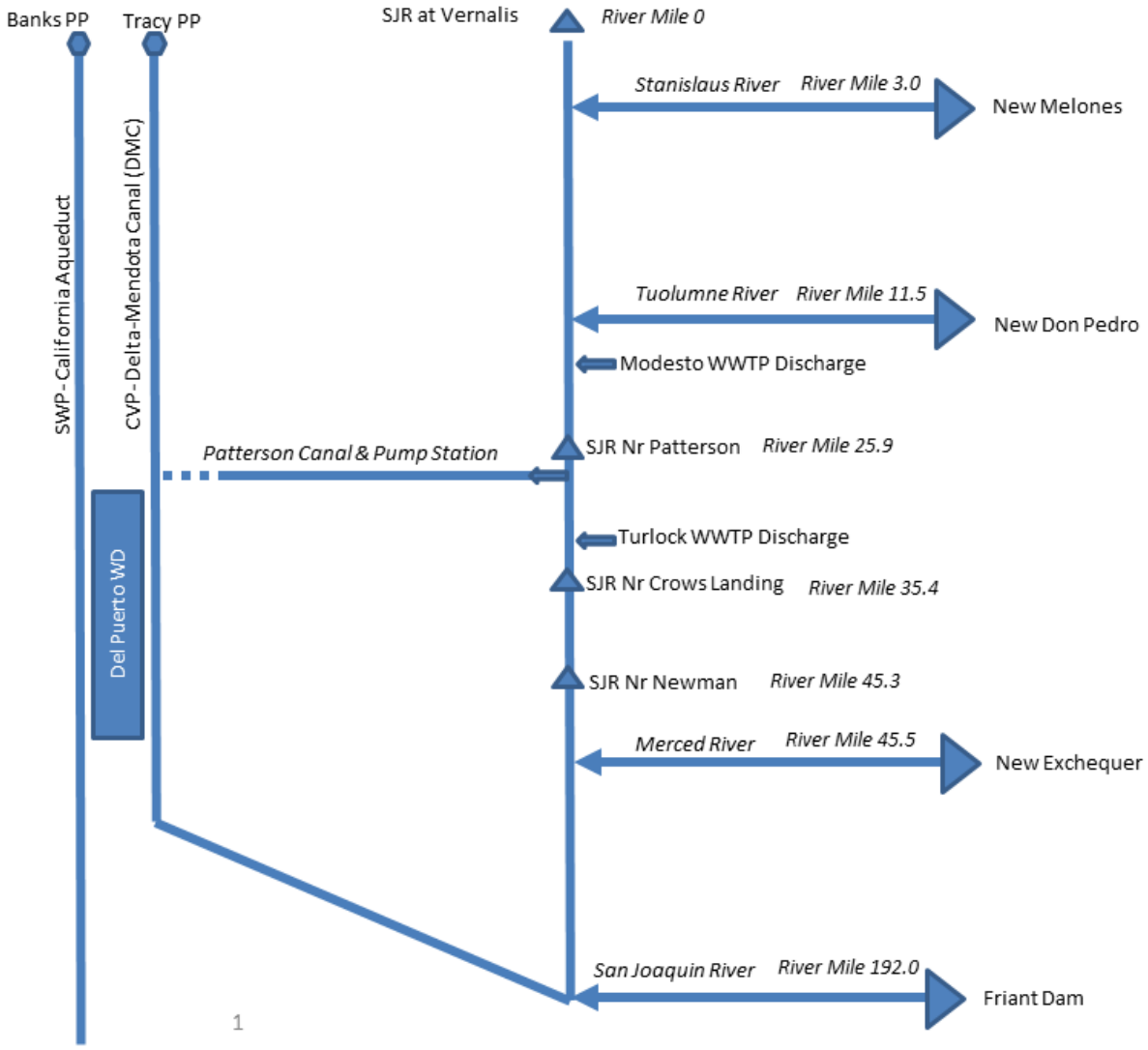
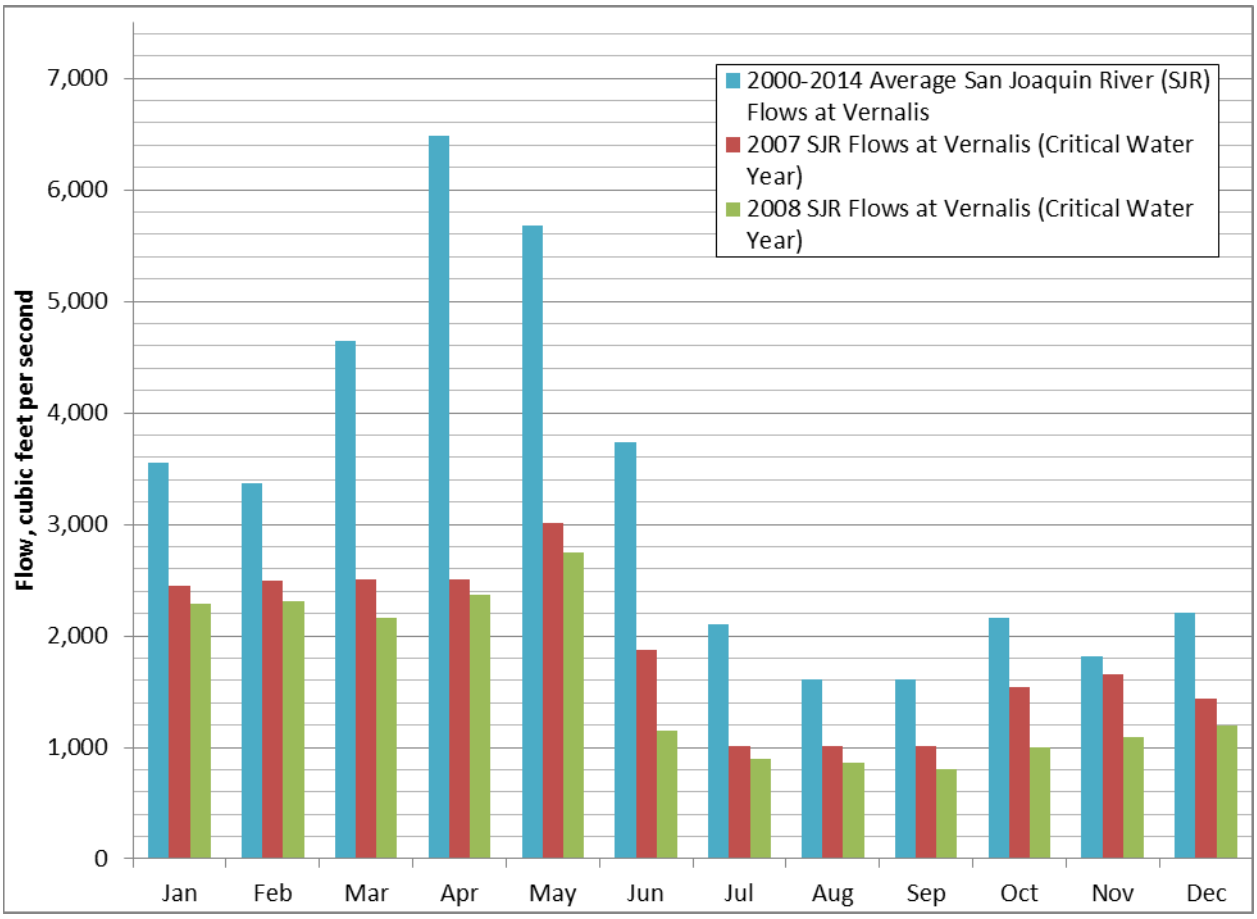


Figure 3.11-2: San Joaquin River Average Monthly Flow, 2003-2014



Reclamation's Long-Term Central Valley Project Operational Criteria and Plan (OCAP, Reclamation 2004) defines flow objectives at the Vernalis gage intended to maintain minimum flows in the SJR and to maintain a specific salinity balance in the Delta. The flow objectives, shown in Table 1, include a higher and lower flow objective; the higher objective is used for more strict Delta salinity requirements.

Table 3.11-1: Base Vernalis Minimum Monthly Average Flow Rate[1]

Year Type	All Years	Wet Year	Above Normal Year	Below Normal Year	Dry Year	Critical Year
Flow Standards for Feb – Apr 14 and May 16 - Jun	N/A	2,130 or 3,420 cfs	2,130 or 3,420 cfs	1,420 or 2,280 cfs	1,420 or 2,280 cfs	710 or 1,140 cfs

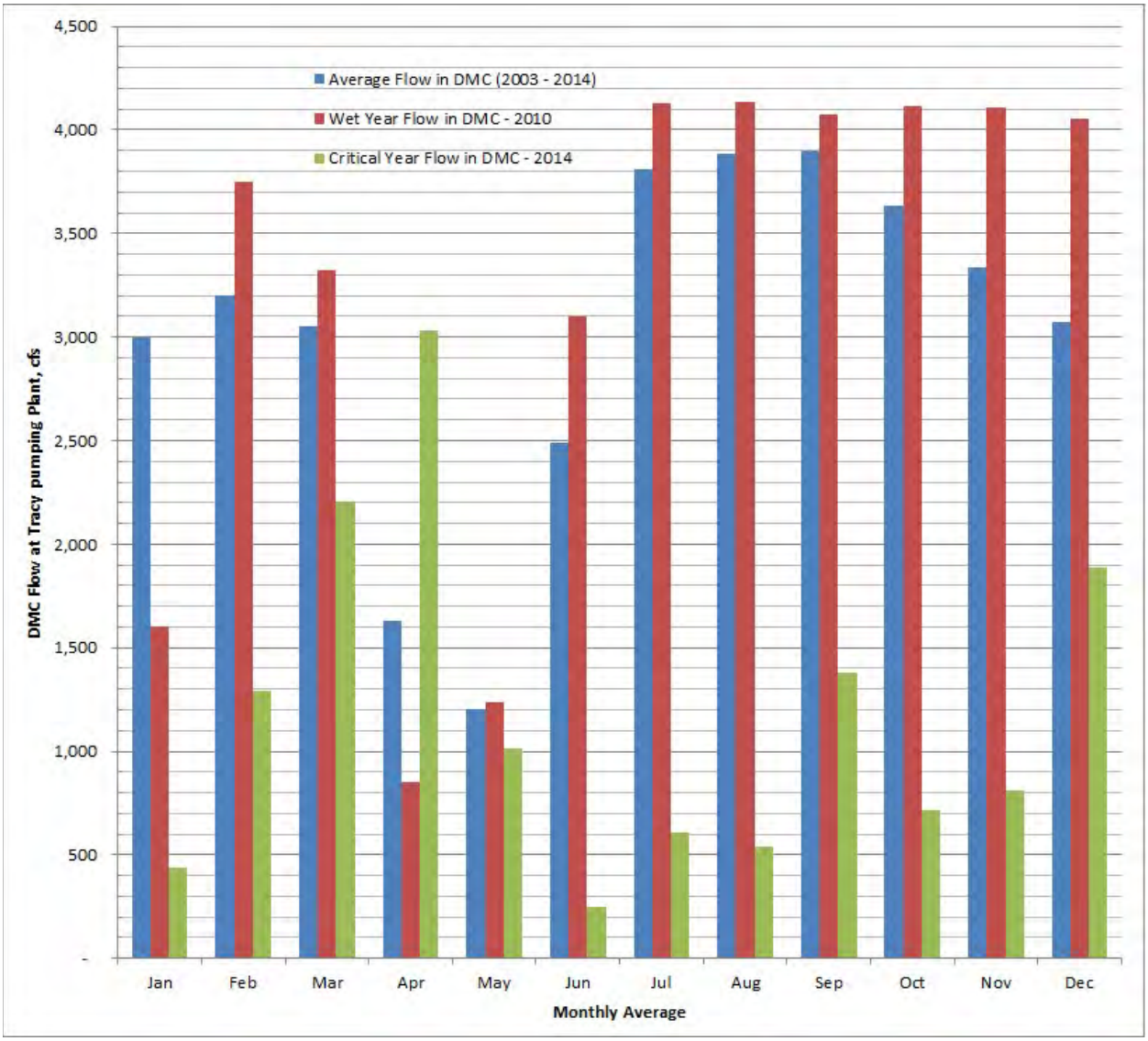
Source: Reclamation 2004

Delta-Mendota Canal (DMC)

The DMC is a Central Valley Project (CVP) facility operated and maintained by the San Luis and Delta-Mendota Water Authority under contract with Reclamation. The 117 mile concrete-lined canal begins at the C.W. Bill Jones Pumping Plant (formerly named the Tracy Pumping Plant), which pumps water from the Sacramento-San Joaquin Delta. The canal runs south along the western edge of the San Joaquin

Valley, parallel to the California Aqueduct for much of its length, but diverges to the east after passing San Luis Reservoir, which receives a portion of its water from the DMC (the remaining portion of water flowing into San Luis Reservoir comes from the California Aqueduct). The water is pumped from the canal into O'Neill Forebay, and then is pumped into San Luis Reservoir by the Gianelli Pumping-Generating Plant. Occasionally, water from O'Neill Forebay is released into the canal. The DMC ends at the Mendota Pool, a small reservoir created by Mendota Dam on the San Joaquin River near the town of Mendota, approximately 30 miles west of Fresno. **Figure 3.11-3** shows average monthly flow in the DMC.

Figure 3.11-3: Average Monthly DMC Flow, 2003-2014



The DMC conveys water for irrigation, wetlands, and municipal/industrial use. The DMC has an inter-connection to the California Aqueduct via an intertie located west of the City of Tracy (Reclamation 2013), and connects with the SWP at O'Neill Forebay.

Reclamation has historically accepted non-project water in the DMC to supplement the supply of CVP water. This water is primarily from wells located along the canal, as well as surface water pumped from

the San Joaquin River. The largest connection to the DMC is a discharge point owned by West Stanislaus Irrigation District that is at Milepost 31.31L.

San Luis Reservoir

The DMC is connected to the San Luis Reservoir via O'Neill Forebay midway along the length of the canal. The 2 million-acre-feet San Luis Reservoir is an artificial lake on San Luis Creek in the eastern slopes of the Diablo Range of Merced County that is jointly owned and operated by Reclamation and the California Department of Water Resources (DWR) and is one of California's largest reservoirs (SCVWD, 2013). During the summer or dry season, water in San Luis Reservoir is used by CVP contractors (as well as State Water Project contractors). As described above, recycled water conveyed into the DMC during low-demand periods could be stored in the south of Delta CVP system, including San Luis Reservoir.

San Joaquin River Water Quality

The San Joaquin River in the project area carries a high salt load at certain times of year and two river segments downstream of the project area from the Merced River to the Tuolumne River and Tuolumne River to Stanislaus River are listed as impaired water bodies for boron[1], electrical conductivity, mercury, water temperature and several pesticides[2]. Water quality in the lower San Joaquin River near Patterson was evaluated as part of a water supply study that was conducted to determine the feasibility of providing recycled water to refuges (Reclamation 2013). The analysis of available water quality data provided information on a variety of constituents and compared water quality in the San Joaquin River and DMC. **Table 3.11-2** shows representative water quality data for the SJR and the DMC, and shows expected quality of blended recycled water from the Modesto and Turlock treatment plants.

Table 3.11-2: Average Water Quality of San Joaquin River, DMC and Recycled Water

Constituent	San Joaquin River Near Patterson[1]	DMC[2]	Estimated Recycled Water Quality
Boron (mg/L)	0.59	0.19	0.20
Nitrate (as N) (mg/L)	13.3	3.6	8.4
Selenium (µg/L)	1.9	0.8	1
Arsenic (µg/L)	4	5	3
Sodium (mg/L)	138	51	116
Total Dissolved Solids (mg/L)	679	275	551

Source: Reclamation 2013

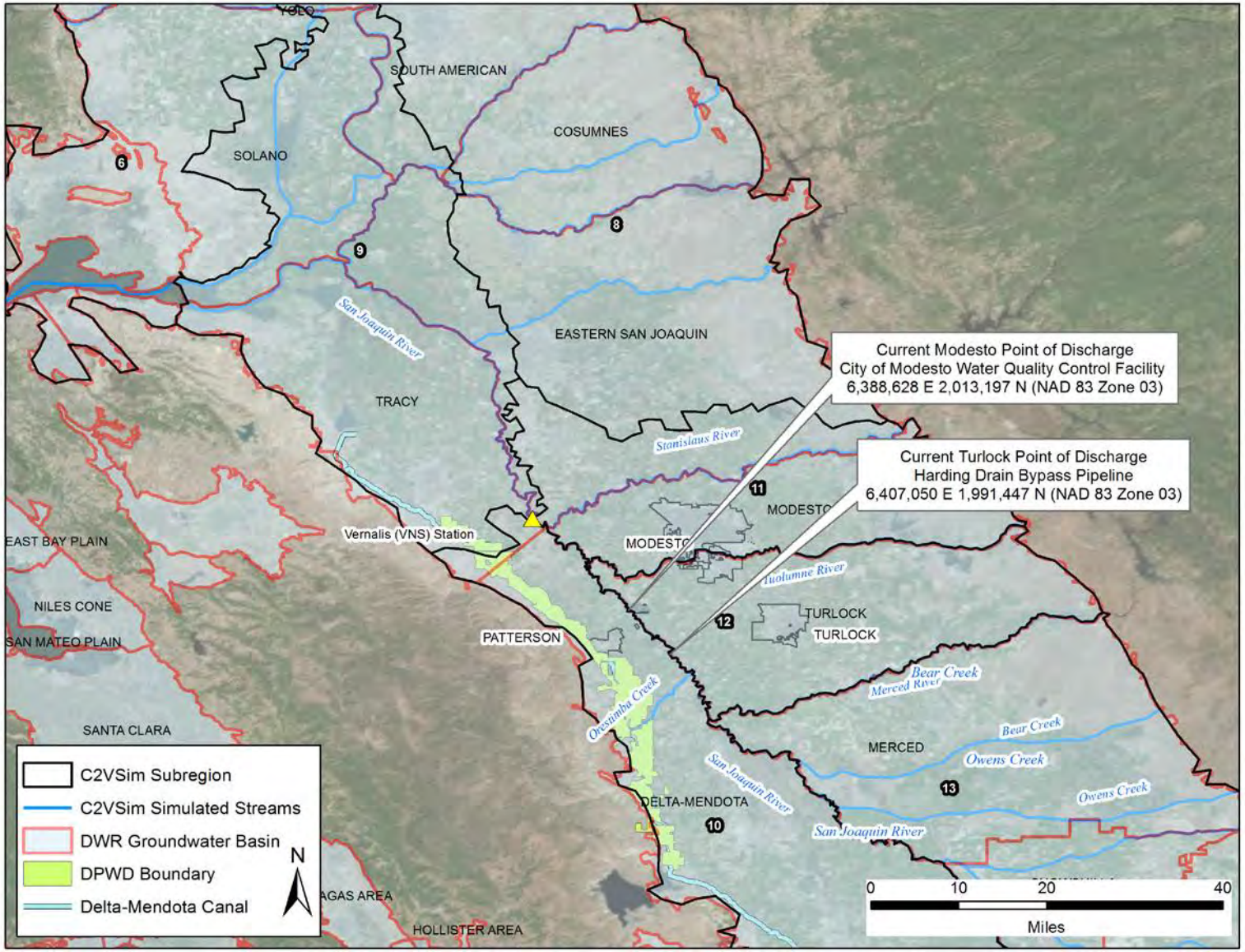
1. Water quality data for the San Joaquin River was compiled from the California Environmental Data Exchange Network (CEDEN) stations "SJR @ Patterson" for the period covering 1995-2011, and from station "San Joaquin River @ PID Pumps".
2. DMC water quality data were obtained from the California Data Exchange Center (CDEC28) and the USBR Mid-Pacific Region's Environmental Monitoring Database, Water quality data from the DMC are from CDEC at the Tracy Pumping Plant (Station ID: TRP) and DMC Headworks (Station ID: DMC), covering the period 2003-13. Data from the USBR Environmental Monitoring Database are from samples collected between 1991 and 2013 at three stations representing the Upper DMC: Milepost 9.87, the DMC at McCabe near Milepost 68, and the O'Neill Forebay Inlet Bridge.

[1] The San Joaquin River from the Merced River to Tuolumne River is listed for boron, but the segment from the Tuolumne River to the Stanislaus River is not.
[2] Segments of the San Joaquin River are listed for chlorpyrifos, DDT (dichloropenyltrichloroethane), DDE, (dichlorodiphenyldichloroethylene), diazinon, alpha–BHC (Benzenehexachloride or alpha-HCH), and group A pesticides.

Groundwater

The proposed project/action is within the San Joaquin Valley Groundwater Basin. As shown in **Figure 3.11-4**, the DPWD service area overlies the Tracy and Delta Mendota subbasins of the San Joaquin Valley Groundwater Basin. The Turlock wastewater treatment plant is located in the Turlock subbasin and treats water that originates from that subbasin. The Modesto Jennings Plant is located in the Turlock subbasin and treats water that originates from the Modesto and Turlock subbasins. The discharge point for both plants is located in the Turlock subbasin. The pipelines for the proposed project are located within the Delta-Mendota subbasin. In general, groundwater quality throughout the region is suitable for most urban and agricultural uses. However, there are localized areas where groundwater quality is impaired with high chloride, boron, nitrate, iron, and manganese (DWR 2003).

Figure 3.11-4: CV2SIM Subregions and DWR Bulletin 118 Groundwater Basins in the NVRRWP Area



3.11.2 Regulatory Framework

This section describes laws and regulations at the federal, state, and local level that may apply to the project.

Federal Policies and Regulations

Clean Water Act

Originally titled the Federal Water Pollution Control Act of 1972, the Clean Water Act (CWA) is administered by USEPA. The CWA allowed USEPA to delegate the National Pollutant Discharge Elimination System (NPDES) Permit Program to state governments, enabling states to perform many of the permitting, administrative, and enforcement aspects of the NPDES Program. In California, these functions are performed by the by the State Water Resources Control Board (SWRCB) and the nine Regional Water Quality Control Boards (RWQCBs). The CWA serves as the primary federal law protecting the quality of the nation's surface waters, including lakes, rivers, and coastal wetlands. The Central Valley Regional Water Quality Control Board (CVRWQCB) has jurisdiction over the Study Area as well as over the entire lengths of both the San Joaquin River and the DMC.

Section 303(d)

CWA Section 303(d) requires states to develop lists of water bodies that will not attain water quality standards after implementation of technology-based effluent limitations by point-source dischargers. Section 303(d) further requires states to develop a Total Maximum Daily Load (TMDL) for each of the listed pollutants and water bodies. A TMDL is the amount of pollutant loading that the water body can receive and still meet water quality standards.

In 2011, the USEPA gave final approval to a revised list of impaired water bodies (hereinafter referred to as the 303(d) list) prepared by the State. The San Joaquin River is listed for several constituents and TMDLs have been approved for some constituents including specific organic pesticides, salt, and boron (SWRCB, 2010). The San Luis Reservoir is listed for mercury but a corresponding TMDL has not yet been developed (SWRCB, 2010). The DMC is not on the 303(d) list.

Section 401

Section 401 of the CWA allows for evaluation of water quality when a proposed activity requiring a federal license or permit could result in a discharge to waters of the U.S. Compliance with Section 401 is required for all projects that have a federal component and may affect water quality. See *Chapter 3.4 Biological Resources* for further discussion of CWA Section 401.

Section 402

Section 402 of the CWA specifically required USEPA to develop and implement the NPDES program. In California, USEPA authorizes the SWRCB to oversee the NPDES program through the RWQCBs. There are several types of NPDES permits relevant to the proposed project.

Individual NPDES Permits (including discharge permits for Publicly-Owned Treatment Works)

All point source dischargers to waters of the United States not governed by a general permit are required to apply for an individual NPDES permit with the Regional Board, unless a specific exemption or waiver is provided. The RWQCB then issues an individual NPDES permit and waste discharge requirements (for any requirements specific to discharges into waters of the State), along with monitoring provisions to ensure compliance. The City of Modesto Jennings Plant and the City of Turlock RWQCF operate under existing individual NPDES permits (CVRWQCB 2010 and CVRWQCB 2012). As noted in *Chapter 1, Introduction,* the Cities of Modesto and Turlock are pursuing revised NPDES permits to allow relocation of their respective discharges from the San Joaquin River to the DMC. The CVRWQCB would address the full range of beneficial uses of the DMC as delineated in the Basin Plan for the Sacramento and San

Joaquin River when considering issuance of an NPDES permit. See discussion below of the Porter-Cologne Water Quality Control Act for further information about the Basin Plan.

General Permit for Discharges of Storm Water Associated with Construction Activity

In 2009, the SWRCB adopted an amended *General Permit for Discharges of Storm Water Associated with Construction Activity,* NPDES Order No. CAS000002, Order No. 2009-0009-DWQ (Construction General Permit). Effective July 1, 2010, the amended General Construction Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP must include a site map(s) showing the construction site perimeter, existing and proposed buildings, lots, roadways, stormwater collection and discharge points, general topography both before and after construction, and drainage patterns across the site. The SWPPP must list Best Management Practices (BMPs) the discharger will use to protect stormwater runoff; a visual monitoring program; a chemical monitoring program for "non-visible" pollutants to be implemented if there is a failure of BMPs; and a sediment monitoring plan if the site discharges directly to a water body listed on the 303(d) list for sediment (Note: The San Joaquin River is not 303(d) listed for sediment.). Because the proposed project would disturb more than one acre, coverage under the General Construction Permit and development of a SWPPP would be required.

Waste Discharge Requirements for Dewatering and Other Low Threat Discharges to Surface Waters

On May 31,2013, the CVRWQCB adopted *Waste Discharge Requirements for Dewatering and Other Low Threat Discharges to Surface Waters,* Order R5-2013-0074 NDPES No. CAG995001 (General Order for Dewatering). Individuals, public agencies, private businesses, and other legal entities discharging relatively pollutant-free wastewaters that pose little or no threat to the quality of surface waters, for a duration of either 4 months or less in duration or have an average dry weather flow less than 0.25 million gallons per day (mgd), may obtain authorization under this General Order to discharge. This General Order covers certain categories of dewatering and other low threat discharges to waters of the United States, which are either 4 months or less in duration or have a daily average discharge flow that does not exceed 0.25 million gallons per day (mgd). As discussed in *Chapter 2, Alternatives and Proposed Project/Action,* dewatering will likely sometimes be employed in the pipeline trenches. It is expected that dewatering would not exceed 0.25 mgd and that the proposed project would be eligible for coverage under the General Order. If dewatering were to exceed 0.25 mgd, an alternative NPDES permit would be needed in order to discharge water from dewatering operations. This same permit would be expected to cover discharges that would be required for hydrostatic testing of the pipeline at the completion of construction.

Section 404

CWA section 404 regulates the discharge of dredged and fill materials into waters of the United States. Areas meeting the regulatory definition of waters of the U.S. are subject to the jurisdiction of the U.S. Army Corps of Engineers (USACE) under provisions of CWA section 404. Construction activities involving placement of fill into jurisdictional waters of the U.S. are regulated by the USACE through permit requirements. No USACE permit is effective in the absence of state water quality certification pursuant to section 401 of the CWA. See *Chapter 3.4 Biological Resources* for further discussion of CWA Section 404.

Rivers and Harbors Act - Section 10

Section 10 of the Rivers and Harbors Act (RHA) (33 U.S.C. § 401 et seq.) requires authorization from USACE for construction of any structure over, in, or under navigable waters of the U.S. The navigable length of the San Joaquin River currently includes 236 miles of the river from Sycamore Road (located 7 miles downstream from State Route [SR] 99 in Fresno County) to the San Francisco Bay. The proposed project/action would need authorization from USACE as two of the alternatives involve installing a pipeline under the navigable portion of the San Joaquin River.

National Flood Insurance Program

NFIP was created to promote flood awareness and reduce flood losses of properties within Special Flood Hazard Areas. Drainage and related flooding hazards are managed in response to requirements established by the National Flood Insurance Act of 1986 and the Flood Disaster Protection Act of 1973, as amended. Requirements of the NFIP are included in the Building Code and through overall City and interagency programs for flood management. In implementing NFIP, FEMA requires that new construction in a flood hazard area meet minimum design standards to place occupied structures above flood hazard areas.

Portions of the Study Area are within the 100-year flood hazard area (generally in areas adjacent to the San Joaquin River), however, no occupied structure would be constructed as part of the proposed project. Above-ground facilities would be limited to air valves along the new pipelines (housed in 4 foot x 4 foot steel cages), modifications to the existing Jennings Plant Pump Station, and, in the case of Alternative 2, a small building (building footprint 40 feet x 50 feet) that would house a new pump station at the Harding Drain Bypass Pipeline. Maintenance staff would visit the pump stations periodically but they would not be regularly occupied.

Reclamation Guidelines for Accepting Non-Project Water into the DMC

In the *Delta-Mendota Canal Non-Project Surface Water Pump-in Program 2014 Water Quality Monitoring Plan* (Reclamation 2014), Reclamation has established guidelines for accepting non-project water in the DMC. Specifically, such water must meet water quality standards before introduction to the canal; (i.e. dilution in the canal is not considered in determining whether non-project water meets water quality standards), and non-project water must not cause alterations of existing water quality parameters outside of standards established by the guidelines. The current water quality standards for non-project surface water are based on statewide domestic water quality regulations[3], and are listed in the January 2014 Monitoring Plan. In 2015, these standards will apply to recycled water that may be introduced into the DMC. Similar to the 2014 Monitoring Plan, the 2015 monitoring plan will measure changes in the quality of water in the DMC caused by the introduction of the non-project surface water, and confirm that the blended water is suitable for downstream water users.

State Policies and Regulations

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act is California's statutory authority for the protection of water quality. Under this act, the State must adopt water quality policies, plans, and objectives that protect the State's waters. The act sets forth the obligations of the SWRCB and RWQCBs pertaining to the adoption of Basin Plans and establishment of water quality objectives. Unlike the federal CWA, which regulates only surface water, the Porter-Cologne Act regulates both surface water and groundwater.

<u>The Water Quality Control Plan (Basin Plan) for the Sacramento River Basin and the San Joaquin River Basin</u>

The Basin Plan (CVRWQCB 2011) is designed to preserve and enhance water quality and protect the beneficial uses of all regional waters. Specifically, the Basin Plan:

1) Designates beneficial uses for surface and ground waters;
2) Sets narrative and numerical objectives that must be attained or maintained to protect the designated beneficial uses and conform to the state's antidegradation policy;
3) Describes implementation programs to protect the beneficial uses of all waters in the Region; and

[3] California Health and Safety Code (Sections 4010-4037) and Administrative Code (Sections 64401 et sq.). July 2013. Title 22 Domestic Water Quality and Monitoring Regulations.

4) Describes surveillance and monitoring activities to evaluate the effectiveness of the Basin Plan [California Water Code Sections 13240 thru 13244, Section 13050(j)].

The Basin Plan is used as the regulatory authority for water quality standards established in local NPDES permits and other CVRWQCB decisions. The Basin Plan designates beneficial uses for the San Joaquin River, the DMC and the San Luis Reservoir.

Title 22 Regulations for Recycled Water

Wastewater reclamation or recycling in California is regulated under Title 22, Division 4, of the California Code of Regulations. The intent of these regulations is to ensure protection of public health associated with the use of recycled water. The California State Water Resources Control Board, Division of Drinking Water (DDW) has jurisdiction over the distribution of recycled wastewater and the enforcement of Title 22 regulations.

Title 22 sets ater quality standards based on types of contact expected between the public and the recycled water, outlining applications for which disinfected tertiary treatment is required and also applications for which three levels of secondary treatment would suffice. Disinfected tertiary treated recycled water, such as that to be produced for the proposed project, is suitable for almost all currently allowed uses for recycled water including irrigation of public parks and all food crops and some industrial processes.

Recycled water treatment criteria vary depending on the application of the recycled water and its contact potential with the public. California Title 22 regulations for tertiary recycled water require that the 7-day median concentration of total coliform bacteria measured in the disinfected effluent does not exceed 2.2 most probable number (MPN) per 100 mL, 23 MPN/100 mL more than once in any 30-day period, and 240 MPN/100 mL in any single sample.

Policy for Water Quality Control for Recycled Water (Recycled Water Policy)

The SWRCB adopted the Recycled Water Policy in May 2009. The purpose of the Recycled Water Policy is to provide direction to the RWQCBs, proponents of recycled water projects, and the public regarding the appropriate criteria to be used in issuing permits for recycled water projects. The Recycled Water Policy describes permitting criteria that are intended to streamline the permitting of the vast majority of recycled water projects (SWCRB, 2013). While the Recycled Water Policy does not explicitly address the main component of the proposed project/action, which is recycled water conveyance, it does, however, strongly encourage the expanded use of recycled water in California. In April 2013, the SWRCB adopted an amendment to the Recycled Water Policy that provided monitoring requirements for Constituents of Emerging Concern (CECs) for groundwater recharge projects using recycled water. Although the proposed project is not a groundwater recharge project, the CEC monitoring requirements established by this amendment are to date the most robust regulatory guidance related to CECs and recycled water.

There are eight CECs for which the Recycled Water Policy requires monitoring, at least in the initial assessment phase of projects that include surface application of recycled water for groundwater recharge of a groundwater basin designated for municipal use. For four of these CECs, monitoring trigger levels have been developed (**Table 3.11-3**). The recycled water policy specifies different monitoring scenarios depending on the ratio of the detected levels of the CEC in the recycled water to the monitoring trigger level.

Table 3.11-3: CECs to be included in Baseline Monitoring for Groundwater Recharge Project Including Surface Application of Recycled Water

Constituent	Constituent Group	Relevance/ Indicator Type	Monitoring Trigger Level (µg/L)
17β-estradiol	Steroid hormones	Health	0.009
Caffeine	Stimulant	Health & Performance	0.35
N-Nitrosodimethylamine (NDMA)	Disinfection byproduct	Health	0.01
Triclosan	Antimicrobial	Health	0.35

Local Policies and Regulations

The discussion of existing land use policies and regulations focuses on Stanislaus County, which is the location for all construction of new physical facilities.

Stanislaus County General Plan

The Stanislaus County General Plan guides development for the County with a 20-year planning horizon. The following goals/policies in the Stanislaus County General Plan, Conservation/Open Space Element would apply to the project:

GOAL TWO: Conserve water resources and protect water quality in the County.

> Policy Five: Protect groundwater aquifers and recharge areas, particularly those critical for the replenishment of reservoirs and aquifers.
>
> Policy Six: Preserve vegetation to protect waterways from bank erosion and siltation.

City of Modesto Urban Area General Plan

The City of Modesto Urban Area General Plan serves as a blueprint for future growth within the City. The Plan outlines policies that focus on a community vision (City of Modesto 2008). There are no policies in the Urban Area General Plan relating to hydrology and water quality that would apply to the project:

3.11.3 Impact Analysis/Environmental Consequences

Methodology for Analysis

This section evaluates whether construction and operation of the facilities associated with the proposed project would result in significant impacts related to hydrology and water quality. The analysis is based on a review of the hydrology and water quality studies referenced herein that have been developed for the proposed project.

Thresholds of Significance

Consistent with Appendix G of the *CEQA Guidelines* an impact to hydrology and water quality would be significant if the proposed project would:

- Violate any water quality standards and/or waste discharge requirements;
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table

level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted);

- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on or off site;
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or off site;
- Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;
- Otherwise substantially degrade water quality (erosion potential);
- Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map;
- Place within a 100-year flood hazard area structures which would impede or redirect flood flows;
- Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam; or
- Result in inundation by seiche, tsunami, or mudflow.

Criteria Requiring No Further Evaluation

Criteria listed above that are not applicable to actions associated with the proposed project are identified below along with a supporting rationale as to why further consideration is unnecessary and a no-impact determination is appropriate.

- *Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on or off site* – The proposed project would not alter the course of a stream or river nor increase erosion or siltation. Recycled water would be conveyed to the concrete-lined DMC via a pipeline. See impact HYD-1 below for a discussion of erosion and siltation during project construction.
- *Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or off site, or create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff* –The proposed project would add very little impervious surface to the landscape as the above-ground facilities are limited to air valves along the new pipelines (housed in 4 foot x 4 foot steel cages), modifications to the existing Jennings Plant Pump Station that would not increase the total footprint of the pump station, and, in the case of Alternative 2, a small building (building footprint 40 feet x 50 feet) that would house a new pump station at the end of the Harding Drain Bypass Pipeline. These facilities are too small to have any appreciable impact on surface runoff and flooding.
- *Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map* – There is no construction of housing associated with the proposed project.
- *Place within a 100-year flood hazard area structures which would impede or redirect flood flows* – Portions of the facilities that would be constructed as part of the proposed project/action would be located within a 100-year flood hazard area. Generally, portions of the Study Area that are within the 100-year flood hazard area are in locations adjacent to the San Joaquin River. The pump station that would be constructed at the end of the Harding Drain Bypass Pipeline as part of Alternative 2 is not within the 100-year flood hazard area. The above-ground facilities that would be constructed

as part of the proposed project within the 100-year flood hazard area are limited to air valves along the underground pipeline. The structures are too small to have any appreciable impact on flood flows.

- *Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam* –The proposed project would include very limited above ground structures and would not appreciably impact flood flows or runoff volumes. The proposed project would have no impact on any levees or dams and would not increase the risk of failure of any levee or dam. The proposed project would redirect the treated effluent of the City of Modesto Jennings Plant and the City of Turlock RWQCF to the DMC. Flows in the DMC are carefully managed and flooding emanating from the DMC due to these additional flows would not occur.
- *Result in inundation by seiche, tsunami, or mudflow* – Tsunamis originating in the Pacific Ocean would dissipate in the San Francisco Bay and pose a negligible hazard to the Study Area. The risk of tsunami in the project area is low enough that California Department of Conservation does not publish a tsunami inundation map for Stanislaus County and all other counties not bordering the Pacific Ocean or the San Francisco Bay. The probability of a seiche occurring in the San Joaquin River is considered minimal as seiches, rare in any circumstance, generally occur only in lakes and enclosed seas.

Impacts and Mitigation Measures

Impact HYD-1 Violation of Water Quality Standards and/or Waste Discharge Requirements (Due to Construction Activities)

Activities involving soil disturbance, excavation, cutting/filling, stockpiling, dewatering and grading activities could result in increased erosion and sedimentation to surface waters during construction of the proposed project. If precautions are not taken to contain contaminants, construction could produce contaminated stormwater runoff (nonpoint source pollution), a major contributor to the degradation of water quality. In addition, hazardous materials associated with construction equipment could adversely affect surface and groundwater quality if spilled or stored improperly. In accordance with the Construction General Permit, a SWPPP would be developed for the proposed project that would detail Best Management Practices for all project construction activities including excavation, dewatering, and stockpiling.

During construction of the proposed project, dewatering would be conducted to remove excess groundwater from excavations created for installation of the pipeline and, in the case of Alternative 2, the pump station at the Harding Drain Bypass Pipeline. Dewatering operations would be conducted in accordance with the General Order for Dewatering or other appropriate NPDES permit. The discharge from the dewatering operations would be evaluated and made part of the project SWPPP.

Construction of pipelines crossing the San Joaquin River would be performed using trenchless technology as described in *Chapter 2, Alternatives and Proposed Project/Action*. This type of construction can be accomplished without surface disturbance of the river, however trenchless construction must be performed carefully to avoid risk of an uncontrolled release of drilling fluids from construction of the pipeline under the river, which is called "frac-out". **Mitigation Measure BIO-1d**, which is described in *Section 3.4, Biological Resources*, would be implemented to protect against frac-out.

Once the pipeline is constructed, hydrostatic testing would need to be conducted, and water from the testing would also need to be discharged. Water from testing would be discharged in accordance with the General Order for Dewatering or other appropriate NPDES permit.

The Construction General Permit and the General Order for Dewatering are well established regulatory processes that effectively limit threats to water quality from construction activities such as those that

would be conducted as part of the proposed project, with implementation of **Mitigation Measures HYD-1a**, **HYD-1b**, **and HYD-1c**, potential impacts would be reduced to less than significant.

Combined Alignment Alternative

The combined alignment alternative would consist of two reaches of one pipeline totaling 69,800 linear feet, involve one crossing under the San Joaquin River, and cross under a total of five irrigation canals (along the Lemon Avenue portion of the alignment). The extent of ground disturbance and potential for construction-related water quality impacts would be similar under the Combined Alignment Alternative and the Separate Alignment Alternative.

Separate Alignment Alternative

The Separate Alignment Alternative would consist of two pipelines totaling 64,000 linear feet, the construction of a pump station at the end of Harding Drain Bypass Pipeline, involve two crossings under the San Joaquin River, and cross under a total of nine irrigation canals (the five that would be crossed in the combined alignment alternative plus four additional canals along the southern pipeline alignment). The extent of ground disturbance and potential for construction-related water quality impacts would be similar under the Combined Alignment Alternative and the Separate Alignment Alternative.

PID Conveyance Alternative

This alternative would consist of one reach of pipeline totaling about 30,100 linear feet, involve construction of a pump station and expanded intake facility in the San Joaquin River, and would cross under a total of five irrigation canals along the PID Main Canal. The extent of ground disturbance for pipeline construction would be less than the Combined Alignment Alternative and the Separate Alignment Alternative. Water quality impacts from pipeline construction would be less than significant with implementation of **Mitigation Measures HYD-1a**, **HYD-1b**, **and HYD-1c.**

Unlike the Combined and Separate Alignment Alternatives, which would avoid construction within the river by constructing pipeline crossings under the river using some form of trenchless technology, construction of an expanded intake facility would require construction within the San Joaquin River. This would be accomplished by placing a sheet pile cofferdam to isolate the construction activities from the river. During both construction and removal of the cofferdam, there is a potential for temporary increases in turbidity and sedimentation downstream of the construction area. These activities would not be expected to contribute to any of the 303(d) listed impairments of the San Joaquin River in the project area or downstream of the intake (alpha BHC, boron, chlorpyrifos, DDT, DDE, diazinon, diuron, *E. coli*, electrical conductivity, Group A pesticides, mercury, toxaphene, and unknown toxicity) (SWRCB 2010). Construction within the river would need to comply with Sections 401 and 404 of the Clean Water Act and would be subject to mitigation described below, including preparation of a SWPPP, compliance with General Orders for Dewatering or other appropriate NPDES Permit.

No Action Alternative

Under the No Action Alternative, no new pipeline or pump station construction would occur. Therefore, no water quality impacts or erosion/sedimentation associated with construction of these facilities would occur.

Significance Determination before Mitigation

Potentially significant for all action alternatives.

Mitigation Measures

Mitigation Measure HYD-1a: Comply with the Construction General Permit (Alternatives 1, 2 and 3)

To minimize the impacts to water quality from construction activities, the proposed project shall implement measures contained in the Construction General Permit including the development of a SWPPP.

Mitigation Measure HYD-1b: Implement BMPs to Control Erosion and Sediment During Construction (Alternatives 1, 2 and 3)

The SWPPP shall specify that all construction activities shall implement multiple BMPs to provide effective erosion and sediment control. These BMPs shall be selected to achieve maximum sediment removal and represent the best available technology that is economically achievable. BMPs to be implemented as part of this mitigation measure shall include, but are not limited to, the following measures:

- Temporary erosion control measures, such as silt fences, staked straw bales/wattles, silt/sediment basins and traps, check dams, geofabric, sandbag dikes, and temporary revegetation or other ground cover, shall be employed for disturbed areas;
- Dirt and debris shall be swept from paved streets in the construction zone on a regular basis, particularly before predicted rainfall events;
- Grass or other vegetative cover will be re-established on unpaved areas of the construction site as soon as possible after disturbance. In paved areas, any removed paving will be replaced as soon as possible; and
- Soil stockpiling sites will be located such that they do not drain directly into the San Joaquin River or irrigation canals.

Multiple BMPs used in combination, properly installed and maintained, can achieve significant sediment removal. BMPs proposed by the project contractor shall be subject to approval by the project proponent, and the project proponent shall require that all parties performing construction under the proposed project incorporate into contract specifications the requirement that the contractor(s) comply with and implement these provisions. The contractor shall also include provisions for monitoring during and after construction activities to verify that these standards are met.

Mitigation Measure HYD-1c: Comply with the General Order for Dewatering or Other Appropriate NPDES Permit (Alternatives 1, 2 and 3)

To minimize the impacts to water quality from dewatering activities, the proposed project shall implement measures contained in the General Order for Dewatering or other appropriate NPDES permit or Waste Discharge Requirement.

Additionally, implementation of Mitigation Measure **BIO-1d - Develop and Implement a Frac-out Contingency Plan for Trenchless Construction** would reduce potential water quality impacts due to frac-out to a less than significant level.

Significance after Mitigation

Less than significant.

Impact HYD-2 Violation of Water Quality Standards and/or Waste Discharge Requirements (at Project Implementation)

Compliance with NPDES Permits for Wastewater/Recycled Water Discharge

Applicable water quality standards for the City of Modesto Jennings Plant and the City of Turlock RWQCF recycled water discharges are fully considered by the individual NPDES permits for each treatment plant. The proposed project does not include any changes to the treatment processes at either treatment plant and the two plants have good compliance histories with their current treatment processes. The CVRWQCB would consider the change in discharge location in the re-issuance of the NPDES permits for both treatment plants. Like all wastewater treatment plant NPDES permits, the NPDES permits for the Jennings Plant and the City of Turlock RWQCF include monitoring requirements for water quality parameters and a wide range of chemical constituents to ensure that the permitted effluent limitations are met and that the discharge does not degrade the water quality of the receiving waters. Future re-issuances of these NPDES permits will consider the results of recent effluent data (data collected over approximately the last five years) in establishing future effluent limitations and monitoring requirements. Discharge to the DMC would require issuance of an NPDES permit, which would establish allowable water quality for discharge and define monitoring requirements for the recycled water.

Compliance with DMC Water Quality Standards

The *Delta Mendota Canal Non-Project Surface Water Pump-in Program 2014 Water Quality Monitoring Plan* (Reclamation 2014) includes two sets of water quality criteria – criteria for the quality of the "pumped-in" non-project water (Reclamation 2014, Table 5) and a more limited set of criteria, which the water in the DMC must meet after the addition of non-project water (Reclamation 2014, Table 8).

Reclamation's 2013 Refuge Recycled Water Supply Study calculated flow-weighted average concentrations of constituents of interest for the combined recycled water from the Jennings Plant and the City of Turlock RWQCF based on available water quality data from both treatment plants. This study also calculated estimated water quality parameters in the DMC after the addition of the recycled water. Complete blending/mixing was assumed. **Table 3.11-4** shows the estimated quality of the recycled water as compared to the water quality standards for acceptance of non-project water. Existing quality of water in the DMC, estimated water quality in the DMC after discharge of recycled water, and the standards for the change that the addition of the non-project water is allowed to cause are shown in **Table 3.11-5.**

Table 3.11-4: Estimated Recycled Water Quality Compared to Reclamation Standards for Acceptance of Non-Project Water

Constituent[1]	Estimated Recycled Water Quality[2]	Water Quality Standard for Acceptance of Non-Project Water into the DMC[3]
Primary		
Aluminum (mg/L)	0.09	1
Antimony (mg/L)	0.0006	0.006
Arsenic (mg/L)	0.003	0.01
Barium (mg/L)	0.08	1
Beryllium (mg/L)	0.00002	0.004
Boron (mg/L)	0.20	0.70
Cadmium (mg/L)	0.00004	0.0005
Chromium (mg/L)	0.001	0.05
Lead (mg/L)	0.0002	0.02
Mercury (mg/L)	2E-6	0.002
Nickel (mg/L)	0.002	0.1
Nitrate (as N) (mg/L)	8.4	10
Nitrate + Nitrite (sum as N) (mg/L)	8.6	10
Nitrite (mg/L)	0.2	1
Selenium (mg/L)	0.001	0.002
Thallium (mg/L)	0.0005	0.002
Secondary		
Chloride (mg/L)	152	250
Copper (mg/L)	0.003	1
Iron (mg/L)	0.1	0.3
Manganese (mg/L)	0.02	0.05
Molybdenum (mg/L)	0.01	0.01
Silver (mg/L)	0.001	0.1
Sodium (mg/L)	**116**	**69**
Specific Conductance (µS/cm)	945	2,200
Sulfate (mg/L)	61	250
Total Dissolved Solids (mg/L)	551	1,500
Zinc (mg/L)	0.05	5
Organic Chemicals		
Chlordane (µg/L)	Not Detected	0.1
Chlorpyrifos (µg/L)	Not Detected	0.025
Diazinon (µg/L)	Not Detected	0.16

1. Constituents listed are those for which recycled water quality data is available.
2. Reclamation 2013
3. Reclamation 2014, Table 5

Of the constituents covered by these standards, only the recycled water sodium content is expected to exceed Reclamation's standards for acceptance of non-project water into the DMC, however the standards for this constituent are met when measured as a part of total dissolved solids or specific conductance (**Table 3.11-4)**. Futhermore, as shown in **Table 3.11-5,** the addition of the recycled water to the DMC would not increase any of the water quality parameters beyond the amount specified in Reclamation's 2014 Monitoring Plan (Reclamation 2014).

Table 3.11-5: Estimated Water Quality in the DMC after Addition of Recycled Water

Constituent	Estimated Recycled Water Quality	Average DMC Water Quality	Estimated Quality of Recycled Water Blended with DMC	Increase After Blending	Maximum Increase Allowed After Blending
Specific Conductance (µS/cm)	945[(1)]	419[(1)]	463[(1)]	44	50[(4)]
Turbidity (NTU)	1.1[(2)]	16.9[(3)]	15.6	-1.3	5[(4)]
Selenium (µg/L)	0.7[(1)]	0.8[(1)]	0.8[(1)]	0.0	1[(4)]

NTU = Nephelometric Turbidity Units

1. Refuge Recycled Water Supply Study (Reclamation 2013). Calculation of blended water quality assumed recycled water flow of 82 cfs and DMC flow of 900 cfs, which roughly corresponds to the 10th percentile flow rate for the Tracy Pumping Plant, This is conservatively large amount of recycled water (9%) as a percentage of the total DMC flow.
2. The existing NPDES permit for the City of Turlock RWQCF specifies that the turbidity of the teritiary effluent (recycled water) shall not exceed 2 NTU within any 24 hour period (CVRWQCB, 2010). The existing NPDES permit for the Jennings Plant specifies that the turbidity of the tertiary effluent shall not exceed 0.2 NTU as a daily average (CVRWQCB, 2012).
3. USBR Mid-Pacific Environmental Monitoring Branch, DMC @ McCabe Road (5/2001 – 11/2014)
4. Reclamation 2014, Table 8

Selenium, a constituent of concern for recycled water use at wildlife refuges, is present in NVRRWP recycled water at a concentration comparable to the existing DMC water quality (0.8 µg/L). The same is true for boron and arsenic (Reclamation 2013). Recycled water would be delivered to the refuges after mixing with the existing water in the DMC.

The recycled water from the Jennings Plant and the City of Turlock RWQCF must comply with effluent limitations for biological oxygen demand (BOD) as per the NPDES permits for those facilities (CVRWQCB 2010, CVRWQCB 2012). For both treatment facilities, the BOD effluent limitations are 10 mg/L average monthly, 15 mg/L average weekly, and 20 mg/L maximum daily for tertiary effluent. Because of the low BOD effluent concentrations, the discharge of recycled water to the DMC would not significantly impact dissolved oxygen concentrations in the DMC. Reclamation has not developed DO water quality standards for the DMC because the DMC, as a concrete-lined water supply channel, does not provide habitat for fish or other species. Generally, an open channel such as the DMC will not have low DO unless there is a significant source of BOD.

Combined Alignment Alternative

The Combined Alignment Alternative and the Separate Alignment Alternative would have identical impacts to the water quality in the DMC. Under both alternatives, recycled water from the Cities of Modesto and Turlock would be directed to the DMC.

Separate Alignment Alternative

As noted above, the Separate Alignment Alternative would have identical impact to water quality in the DMC as the Combined Alignment Alternative.

PID Conveyance Alternative

Under this alternative, instead of discharging recycled water directly to the DMC, the recycled water would be discharged to the San Joaquin River, and then water would be diverted from the river and conveyed through the PID system to the DMC. Discharge of recycled water to the river would not be expected to violate water quality standards as both the City of Modesto WQCF and the City of Turlock RWQCF have good histories of compliance with their NPDES Permits, and both cities would supply tertiary treated recycled water. Conveyance and discharge of river water to the DMC occurs on an ongoing basis, and the PID Conveyance Alternative would not be expected to have an adverse effect on water quality in the DMC.

No Action Alternative

Under the No Action Alternative, recycled water from Modesto and Turlock would not be discharged to the DMC. Therefore, no changes in DMC water quality would occur. Discharges to the San Joaquin River would continue.

Significance Determination before Mitigation

Less than significant for all action alternatives. Less than significant for No Action Alternative.

Mitigation Measures

No mitigation measures are required.

Impact HYD-3 Substantial Depletion of Groundwater Supplies or Substantial Interference with Groundwater Recharge

Although both cities would retain permits to discharge to the river, the discharges would only be expected to occur under unusual or extreme circumstances such as when the DMC was not available due to some type of failure, thus the proposed project would result in a slight reduction of stream flows in the San Joaquin River as the current discharges from the Cities of Modesto and Turlock to the San Joaquin River no longer would occur on a regular basis. The average annual flow of the San Joaquin River between 1924 and 2011 was 3.3 million AF/year (**Appendix G**: Evaluation of NVRRWP Impact on Groundwater, 2014). As a result of the proposed project, the average annual stream flows at Vernalis station would be reduced by approximately 18,000 AF/year, or approximately 0.5% of the average annual flows (**Appendix G**: Evaluation of NVRRWP Impact on Groundwater, 2014).

As documented in **Appendix G**, Evaluation of NVRRWP Impact on Groundwater, the impact of the proposed project's reductions in the San Joaquin River stream flows on groundwater storage was analyzed using the C2VSim groundwater simulation model developed and maintained by DWR. The analysis considered groundwater in the vicinity of the San Joaquin River from the project area to the Delta, including areas downstream of the Vernalis station (located approximately 25 miles downstream from the Harding Drain Bypass Pipeline). This entire area is within the San Joaquin River groundwater basin and includes the subbasins shown in **Table 3.11-6** below. The simulation period for this version of C2VSim-FG is 88 years incorporating historical hydrology from 1922 to 2009.

The model showed that the reduction of stream flows would increase stream gains (reduce groundwater storage) from the aquifer when the stream is a gaining stream (i.e. groundwater levels are higher than stream levels). Correspondingly, the model showed that reduction of stream flows would reduce stream losses to the aquifer (increase groundwater storage) when the stream is a losing stream (i.e. groundwater levels are lower than stream levels). Groundwater storage would be reduced from September to March

(when irrigation demands are low); however, groundwater storage would increase from April to August (when irrigation demand are high).

The estimated changes in groundwater storage over the 88 years of simulation along with the cumulative change in groundwater storage are shown in **Figure 3.11-5 and Figure 3.11-6**. The change in groundwater storage varies from approximately -280 AF/year to approximately 150 AF/year (**Figure 3.11-6**) and results in an estimated 2,420 AF less groundwater in storage over the 88 year simulation period. This equates to an average annual reduction in groundwater storage of 27 AF/year (**Table 3.11-6)**, which represents approximately 0.15% - 0.2% of the annual stream/groundwater interaction. This is within the potential margin of error of the groundwater simulation model.

Figure 3.11-5: Average Monthly Change in Groundwater Storage for Groundwater Basin C2VSim Subregions 8 to 12

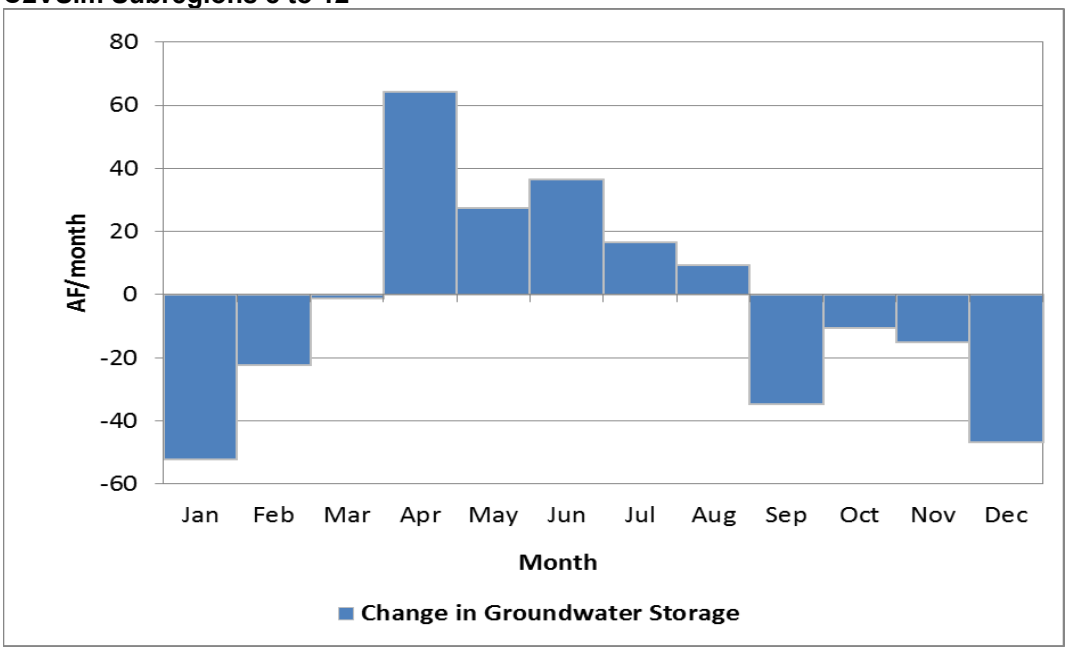


Figure 3.11-6: Estimated Cumulative Change in Groundwater Storage C2VSim Subregions 8 to 12

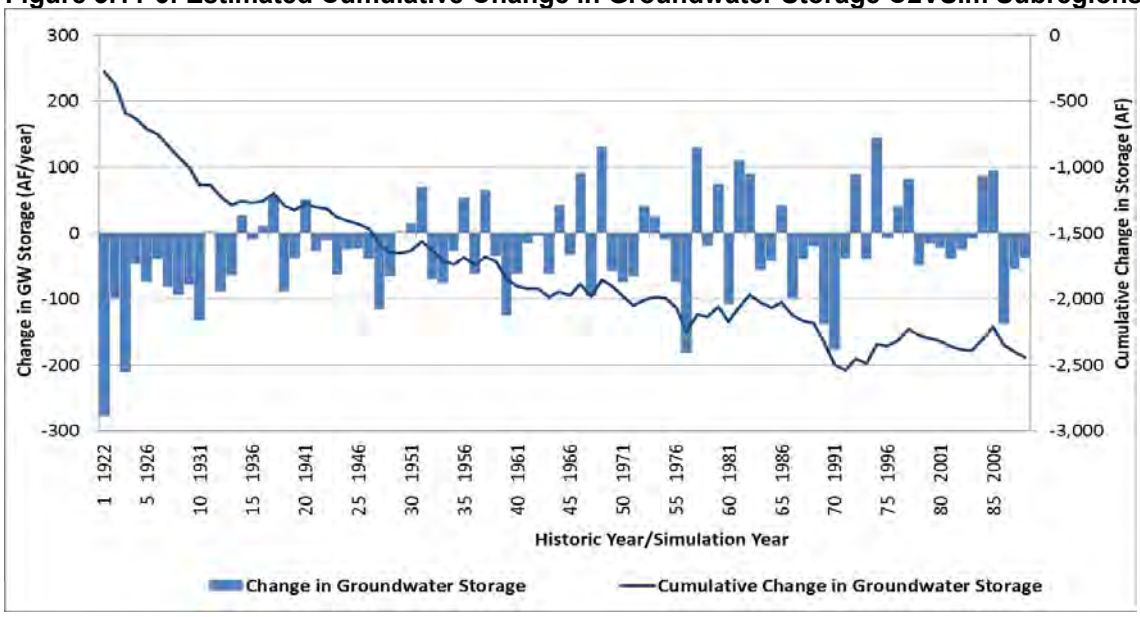


Table 3.11-6: Change in Groundwater Storage for Groundwater Subregions Downstream of the City of Modesto WPCF and the City of Turlock

C2VSim Subregion	DWR Bulletin 118 Groundwater Basin	Change in Groundwater Storage	
		Average Annual (AF/year)	Cumulative (AF)
8	Eastern San Joaquin, Cosumnes, South American	-7	-630
9	Tracy, Solano, Eastern San Joaquin, South American	-10	-900
10	Delta-Mendota	-5	-450
11	Modesto, Eastern San Joaquin	-3	-230
12	Turlock	-2	-210
Total		**-27**	**-2,420**

Combined Alignment Alternative

The Combined Alignment Alternative and the Separate Alignment Alternative would have identical impacts to groundwater. Under both alternatives, the existing discharges from the Cities of Modesto and Turlock would be redirected from the San Joaquin River to the DMC.

Separate Alignment Alternative

The Combined Alignment Alternative and the Separate Alignment Alternative would have identical impacts to groundwater.

PID Conveyance Alternative

With this alternative, recycled water would still be discharged to the river, but then diverted at the PID intake facility. Recycled water from the City of Turlock would thus be in the river for 3.6 miles before being diverted at the PID intake. A volume of water matching the amount discharged by the City of Modesto would also be diverted at the PID intake, but this would occur upstream of the Modesto discharge location. As compared to the Combined and Separate Alignment Alternatives, there would thus be slightly more water in the river between the Turlock discharge and the PID intake, and slightly less water in the river between the PID intake and the Modesto discharge location. The net impact on amount of groundwater recharge would not be expected to be measurably different than the estimates presented above for the Combined and Separate Alignment Alternatives, because downstream of the Modesto discharge location the volume of water in the river would be the same for all three action alternatives. Impacts would be less than significant.

No Action Alternative

Under the No Action Alternative, recycled water from the Cities of Modesto and Turlock would not be directed to the DMC. While the Cities of Modesto and Turlock currently discharge to the San Joaquin River, they could pursue other options for use of the recycled water that would also reduce stream flows in the San Joaquin River.

Also under the No Action Alternative, DPWD would continue to rely on the CVP as its primary water supply. To offset reductions in CVP allocations, the District would continue to execute water transfers / exchanges and to pump groundwater from private wells. Consequently, the total impact on groundwater storage from the No Action Alternative could be greater than any impact of the proposed project on groundwater storage. Extraction of groundwater would be conducted within the bounds of existing regulations, including recently passed legislation, specifically SB 1168, AB 1739, and SB 1319, which

together enacted the Sustainable Groundwater Management Act providing a framework for improved management of groundwater supplies by local authorities.

Significance Determination before Mitigation

Less than significant for all action alternatives. Potentially significant for the No Action Alternative.

Mitigation Measures

No mitigation measures are required for the pipeline corridor alternatives. No mitigation is possible for the No Action Alternatives.

Impact HYD-4 Otherwise substantially degrade water quality (Constituents of Emerging Concern)

One common concern with the use of recycled water involves CECs, which include classes of chemicals such as pharmaceuticals, current use pesticides, and industrial chemicals. Many CECs are potentially present in recycled water, surface waters, and groundwater, but the ability to detect many of these chemicals at low concentrations is so recent that a robust framework for interpreting their potential human or ecosystem health effects is unavailable. Although there is currently no applicable regulatory guidance regarding CECs in recycled water used as part of a project such as the proposed project, in California, the most well-established regulations and policies related to CECs in recycled water are associated with the Recycled Water Policy. The SWRCB adopted the Recycled Water Policy in May 2009 and in April 2013 adopted an amendment to the Recycled Water Policy that provided CEC monitoring requirements for surface application of recycled water for groundwater recharge of a groundwater basin designated for municipal use.

Reclamation's 2013 Refuge Water Quality Supply Study (Reclamation 2013) included analysis for CECs in samples collected from City of Turlock RWQCF tertiary effluent, the City of Modesto Jennings secondary effluent (the tertiary treatment facility was not operational at the time), the DMC, the Patterson Irrigation District (PID) Main Canal, and a delivery point for DMC water to the Refuges (the China Island Delivery Point). Analytical results for the CECs for which the Recycled Water Policy specifies monitoring trigger levels are shown in **Table 3.11-7** below:

Table 3.11-7: 2013 Refuge Recycled Water Supply Study Analytical Results for CECs in Recycled Water Policy for Jennings Plant and Turlock RWQCF

Constituent	Monitoring Trigger Level	Modesto Jennings Plant Effluent (µg/L)	Turlock RWQCF Effluent (µg/L)	
17β-estradiol	0.009	<0.004	<0.004	<0.004
Caffeine	0.35	0.073	0.920	0.700
N-Nitrosodimethylamine (NDMA)	0.01	<0.002	0.0024	0.0025
Triclosan	0.35	<0.01	<0.01	<0.01

While the samples of City of Turlock RWQCF effluent contained levels of caffeine above the monitoring trigger level, it should be noted that:

- The CEC monitoring trigger levels in the Recycled Water Policy were developed for groundwater recharge projects for which the end use of the recharged water included municipal use (drinking water use). The proposed project is not a groundwater recharge project;
- The ratios of the detected levels of caffeine in the City of Turlock RWQCF to the monitoring trigger levels are 2.6 and 2.0. At these ratios, the Recycled Water Policy specifies only continued monitoring for CECs.

Caffeine and other CECs were also detected in the China Island, DMC and PID main canal samples. The detection of CECs in the China Island, DMC and PID Main Canal samples was to be expected as wastewater treatment plants discharge to the source waters for each. The source water in the DMC is drawn from the Delta and multiple wastewater treatment plants discharge treated effluent to the Delta or to waterways that flow to the Delta. The California State Water Project Watershed Sanitary Survey 2011 Update (State Water Project 2012) estimated that the discharge from the Sacramento, Stockton, and Manteca wastewater treatment plants (three of the largest wastewater dischargers to Delta tributaries) can comprise up to approximately 3% of the flow at the DMC intake at C.W. "Bill" Jones Pumping Plant (Delta intake for DMC).Similarly, the water pumped into the PID Main Canal is sourced from the San Joaquin River. Upstream of the PID diversion, there are a number of wastewater treatment plants that discharge into the San Joaquin River, including the City of Turlock.

Because the proposed project would not significantly change the extent of CECs in the DMC, this impact is considered less than significant.

Combined Alignment Alternative

The Combined Alignment Alternative and the Separate Alignment Alternative would have identical impacts to the water quality in the DMC. Under both alternatives, recycled water from the Cities of Modesto and Turlock would be directed to the DMC.

Separate Alignment Alternative

As noted above, the Separate Alignment Alternative would have identical impact to water quality in the DMC as the Combined Alignment Alternative.

PID Conveyance Alternative

This alternative would discharge river water containing recycled water to the DMC, instead of directly discharging recycled water. Because CECs are present in all potential sources of water, the impacts of this alternative would be similar to the Combined and Separate Alignment Alternatives, and would be less than significant.

No Action Alternative

Under the No Action Alternative, recycled water from Modesto and Turlock would not be discharged to the DMC. Therefore, no changes in DMC water quality would occur. As stated above, however, the DMC currently contains recycled water originating from source Delta tributaries.

Significance Determination before Mitigation

Less than significant for Alternatives 1, 2 and 3. Less than significant for the No Action Alternatives.

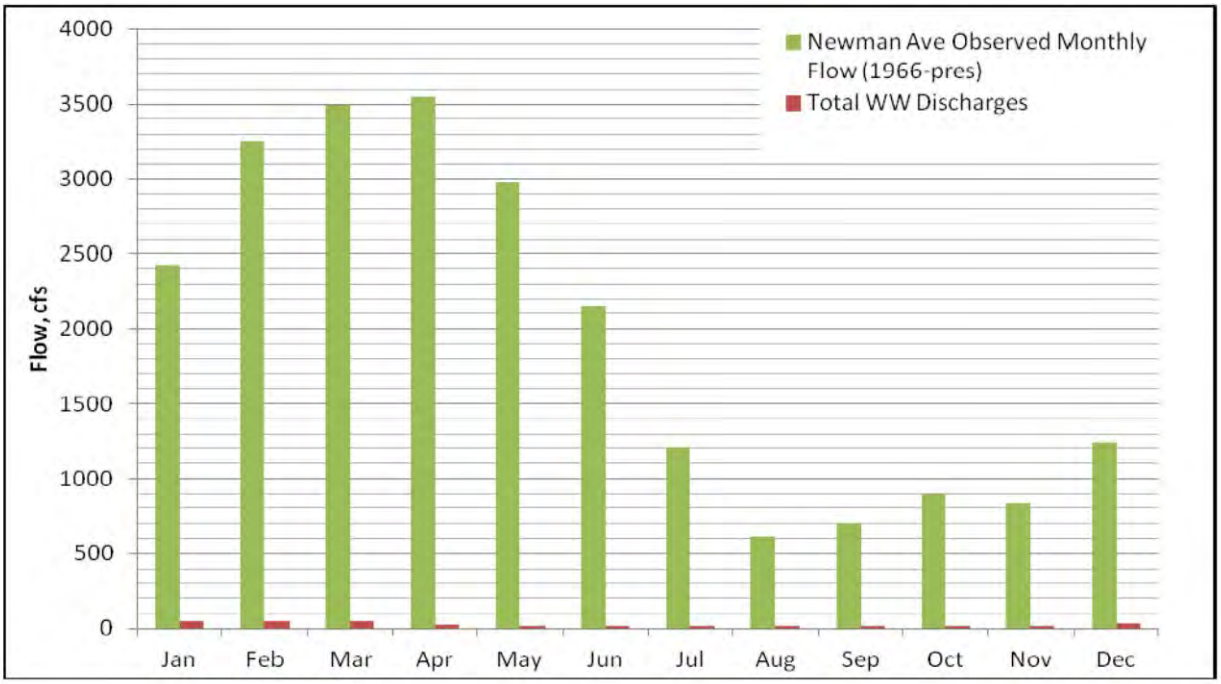
Mitigation Measures

No mitigation measures are required.

Impact HYD-5 Reduction of Flows in San Joaquin River

Under both Alternatives 1 & 2, current discharge to the San Joaquin River would be discontinued and flows from the two treatment plants would be redirected to the DMC. The discharge from the two treatment plants represents a small portion of the total flow in the San Joaquin River (RMC 2013**). Figure 3.11-7** below shows the recycled water discharge compared to the monthly average flows at the Newman Gage. The Newman Gage is located upstream of the Cities of Modesto and Turlock's wastewater discharges (approximately 10 miles upstream of the Turlock discharge) and is the closest upstream river gage with a long history of river flow data.

Figure 3.11-7: Comparison of San Joaquin River Monthly Average Flows at Newman Gage and Recycled Water Discharges



Source: RMC 2013

The C2Vsim model discussed under **Impact HYD-3** and in **Appendix G**, Evaluation of NVRRWP Impact on Groundwater was used to simulate the impact of removing the current recycled water discharges from the San Joaquin River on downstream river flows at the Vernalis station, which measures the San Joaquin River's contribution to Delta outflows. The Vernalis station is approximately 20 miles downstream of the Modesto discharge point and is also downstream of the points at which the Merced and Tuolumne Rivers enter the San Joaquin River. The model simulation showed that the average annual stream flows at Vernalis station would be reduced by approximately 18,000 AF/year (**Appendix G**: Evaluation of NVRRWP Impact on Groundwater, 2014). The average discharge of the San Joaquin River between 1924 and 2011 was 3.3 million AF/year . The reduction in San Joaquin River stream flows at Vernalis due to NVRRWP is approximately 0.5% of the average annual flows. This is considered to be a less than significant impact on Delta outflows (**Appendix G**: Evaluation of NVRRWP Impact on Groundwater, 2014).

The reduction in river stage height (a reflection of water depth in the river) associated with curtailment of the recycled water discharges is estimated to range from approximately 0.25 inches to 1 inch (Hanson 2013). This is considered to be a less than significant impact.

Additionally, removing recycled water flows from the San Joaquin River would reduce the loading of salt into the river because the salts present in the recycled water would no longer be added to the river (RMC 2013).

See also **Impact BIO-5** in *Chapter 3.4, Biological Resources* for a discussion of the less than significant impacts of reduced river flows on special-status fishes.

Combined Alignment Alternative

The Combined Alignment Alternative and the Separate Alignment Alternative would have identical impacts on flows in the San Joaquin River. Under both alternatives, current recycled water from the Cities of Modesto and Turlock would be directed to the DMC.

Separate Alignment Alternative

As noted above, the Separate Alignment Alternative would have the same impact to flows in the San Joaquin River as the Combined Alignment Alternative.

PID Conveyance Alternative

The PID Conveyance alternative would have essentially the same impact to flows in the San Joaquin River as the Combined and Separate Alignment Alternatives. The flows for all three action alternatives would be identical downstream of the Modesto discharge location. As compared to the Combined and Separate Alignment Alternatives, there would be very minor differences in flows for the few miles between the Turlock and Modesto discharge sites, with slightly more water remaining in the river between the Turlock discharge and the PID intake, and slightly less water in the river from the PID intake to the Modesto discharge site. Impacts downstream of Modesto would be less than significant.

No Action Alternative

Under the No Action Alternative, recycled water from Modesto and Turlock would not be discharged to the DMC. While the Cities of Modesto and Turlock currently discharge their recycled water to the San Joaquin River, they could pursue other options for use of the recycled water that would also reduce stream flows in the San Joaquin River.

Significance Determination before Mitigation

Less than significant for all action alternatives.

Mitigation Measures

No mitigation measures are required.

Impact HYD-6 Effect on Delta Exports at Banks and Tracy Pumping Plants

All Action Alternatives

As noted above in Impact HYD-5, the change in San Joaquin River stream flows at Vernalis due to the NVRRWP is less than significant. In addition to the evaluation of flows, the potential effect on Delta exports was analyzed using the CalSim II model developed by the California Department of Water Resources (DWR) for Delivery Reliability Reports (DRR). The CalSim II model was configured to run with and without discharges of recycled water by the Cities of Modesto and Turlock to the San Joaquin River. The two Calsim II model scenarios were compared to evaluate the impact of NVRRWP on Delta exports at the Banks and Jones pumping plants.

The changes in San Joaquin River stream flows at Vernalis due to the NVRRWP would result in minimal changes to water available in the Delta for exports at the Banks and Jones pumping plants. A comparison of results of CalSim scenarios with and without the NVRRWP shows no changes at the two pumping plants, thus the project flow changes at Vernalis would have a less than significant impact on the Delta pumping plants and is considered negligible and well within the range of accuracy of CalSim II (RMC 2014).

No Action Alternative

Under the No Action Alternative, recycled water from Modesto and Turlock would continue to be discharged to the river. However, as noted above, the Cities of Modesto and could pursue other options for use of the recycled water that would also reduce stream flows in the San Joaquin River.

Significance Determination before Mitigation

Less than significant for all action alternatives.

Mitigation Measures

No mitigation measures are required.

Cumulative Impacts

Cumulative Impacts to Groundwater Storage

As discussed under **Impact HYD-3,** cumulative or long-term impacts of reduced San Joaquin River flows on groundwater storage would be less than significant.

Cumulative Impacts to San Joaquin River Flows

As discussed under Impact **HYD-6**, the reduction is San Joaquin River stream flows at Vernalis due to NVRRWP is approximately 0.5% of the average annual flows (Appendix G: Evaluation of NVRRWP Impact on Groundwater, 2014). This is considered to be a less than significant impact. The C2Vsim model that was used to estimate changes in San Joaquin River flows considers cumulative impacts of multiple environmental factors. C2VSim simulates water movement through the interconnected land surface, surface water and groundwater flow systems in the 20,000 mi^2 of the alluvial Central Valley aquifer. C2VSim dynamically calculates groundwater conditions based on urban and crop water demands, long-term hydrologic and meteorologic records, land use, cropping patterns, and other inputs.

Cumulative Impacts in the DMC

The DMC is used to convey water from various approved sources. The quality of water being introduced is tested to limit the potential for degradation of blended water supplies. This testing program is anticipated to adequately protect the quality of water in the DMC from the cumulative effects of the proposed project and other water conveyance actions. As noted under Impact HYD-2, discharge to the DMC would require issuance of an NPDES permit, which would establish monitoring requirements for recycled water quality.

Although capacity in the DMC is limited, SLDMWA and Reclamation actively operate the canal in order to maximize conveyance capacity at all times. Although non-CVP water such as the recycled water that would be conveyed under the proposed project has a lower priority than CVP water for conveyance in the DMC, the operators now have the ability to call on the use of the California Aqueduct-DMC Intertie to alleviate DMC capacity issues. For these reasons, the proposed project is not anticipated to cause conflicts or other cumulative impacts to DMC operations.

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3.12 Indian Trust Assets

This section presents the physical and regulatory setting related to Indian Trust Assets in the vicinity of the proposed NVRRWP project. The impact analysis considers whether the proposed project would have potential impacts to ITAs.

3.12.1 Environmental Setting/Affected Environment

The study area for the analysis is Stanislaus County. This section describes the environmental setting for Indian Trust Assets within the study area.

There are no Indian Trust Assets in the study area. The nearest Indian Trust Asset is the Chicken Ranch Rancheria, approximately 44 miles northeast of the project area.

3.12.2 Regulatory Framework

This section describes laws and regulations that may apply to the proposed project.

Federal Policies and Regulations

Indian Trust Assets (ITAs) are legal interests in assets that are held in trust by the U.S. Government for federally recognized Indian tribes or individuals. The trust relationship usually stems from a treaty, EO, or act of Congress. The Secretary of the Interior is the trustee for the United States on behalf of federally recognized Indian tribes. "Assets" are anything owned that holds monetary value. "Legal interests" are defined as a property interest for which there is a legal remedy, such as compensation or injunction, if there is improper interference. Assets can be real property, physical assets, or intangible property rights, such as a lease, or right to use something. Indian Trust Assets cannot be sold, leased or otherwise alienated without United States' approval. Trust assets may include lands, minerals, and natural resources, as well as hunting, fishing, and water rights. Indian reservations, rancherias, and public domain allotments are examples of lands that are often considered trust assets. In some cases, Indian Trust Assets may be located off trust land. Reclamation shares Indian trust responsibility with all other agencies of the Executive Branch to protect and maintain Indian Trust assets reserved by or granted to Indian tribes, or Indian individuals by treaty, statute, or Executive Order.

3.12.3 Impact Analysis/Environmental Consequences

Methodology for Analysis

Potential impacts on Indian Trust Assets are analyzed based on the potential for the proposed project to affect such assets.

Thresholds of Significance

CEQA Guidelines do not require the evaluation of Indian Trust Assets. NEPA requires the evaluation of project effects on Indian Trust Assets. An impact to Indian Trust Assets would be considered significant if the project would:

- Adversely affect (modify or alter) an Indian Trust Asset.

Criteria Requiring No Further Evaluation

Criteria listed above that are not applicable to actions associated with the proposed project are identified below along with a supporting rationale as to why further consideration is unnecessary and a no-impact determination is appropriate.

- *Affect Indian Trust Assets* – The proposed project does not have a potential to affect Indian Trust Assets. The nearest Indian Trust Asset is the Chicken Ranch Rancheria, approximately 44 miles northeast of the project area.

3.12.4 References

Rivera, Patricia. Native American Affairs Program Manager, Bureau of Reclamation. 2014. Department of the Interior. Email communication regarding the North Valley Regional Recycled Water Program. January 30.

3.13 Land Use and Planning

This section presents the physical and regulatory setting for land use and planning surrounding the proposed project. The impact analysis considers the potential for the North Valley Regional Recycled Water Program (NVRRWP) to physically divide the community or conflict with adopted land use plans or policies. The analysis is based on a review of local land use plans and policies and aerial imagery.

3.13.1 Environmental Setting/Affected Environment

This section describes the environmental setting for current land use within the study area, which includes the proposed project site and adjacent land uses. Direct land use impacts would be focused in Stanislaus County, where all project facilities are located, but project water supply would benefit agricultural land uses in the entire DPWD service area. Additionally, information is provided regarding land uses for the refuges that could receive water supply from the project.

Regional Land Use

The proposed study area is located within California's San Joaquin Valley, approximately 13 miles west of the City of Turlock and 15 miles southwest of the City of Modesto. The study area falls to the east of Interstate 5 and to the west of SR 33. Land use within and adjacent to the proposed study area is characteristic of rural portions of the central San Joaquin Valley and unincorporated portions of Stanislaus County. From an aerial perspective, the landscape is dominated by large square plots with sparse structural development. Irrigated pasture, orchards, row crops, various agricultural structures, dairies, and scattered rural residences dominate the land use pattern for virtually all of the study area.

The project would serve water to agricultural uses within the DPWD service area in San Joaquin, Stanislaus and Merced counties. More information on Agriculture within the region is presented in *Chapter 3.2, Agriculture and Forestry Resources.* More developed and urban land uses are situated to the east of the proposed study area in the Cities of Turlock and Modesto.

The proposed project would also make recycled water available to the south of the Delta CVPIA-designated Refuges to meet CVPIA requirements. Descriptions of the Refuges that could be served by the proposed Project are provided below, and are based on information presented in Reclamation's Recycled Water Refuge Study (Reclamation 2013).

San Luis NWR Complex

The San Luis NWR Complex, managed by USFWS, is located approximately 10 miles north of Los Banos, California. It encompasses over 26,800 acres of wetlands, riparian forests, native grasslands, and vernal pools. The NWR Complex supports populations of endemic tule elk and is host to assemblages of birds, mammals, reptiles, amphibians, fish, insects, and plants; some of which are endangered species. The NWR is a major wintering ground and migratory stopover point for large concentrations of waterfowl, shorebirds, and other water birds. The San Luis NWR includes the East Bear Creek Unit, West Bear Creek Unit, Freitas Unit, Kesterson Unit, and San Luis Unit (Reclamation 2013).

Kern NWR

Kern National Wildlife Refuge, managed by USFWS, is located approximately 20 miles west of the City of Delano. The Refuge consists of 11,249 acres of natural desert uplands, a relict riparian corridor, and developed marsh; it is situated on what was once the largest freshwater wetland complex in the western United States. Kern Refuge provides optimum wintering habitat for migratory birds with an emphasis on waterfowl and water birds. Through restoration and maintenance of native habitat diversity, the refuge also provides suitable habitat for several endangered species as well as preserving a remnant example of the historic valley uplands in the San Joaquin Desert (Reclamation 2013).

Wildlife Areas

Volta WA, managed by CDFW, is located approximately 0.75 mile north of Volta. Volta WA consists of 2,891 acres of managed marsh and valley alkali scrub, which support 150 species of birds, including large numbers of waterfowl and shorebirds (Reclamation 2013).

Mendota WA, managed by CDFW, is located approximately three miles south of Mendota near Whites Bridge. It consists of 11,802 acres with flatlands and floodplain (Reclamation 2013).

Los Banos WA, managed by CDFW, is located approximately four miles northeast of Los Banos, and includes the Mud Slough Unit. Los Banos WA was the first of a series of waterfowl refuges established throughout the state to manage habitat for wintering waterfowl and consists of more than 6,217 acres of wetland habitat which includes lakes, sloughs and managed marsh. The Refuge supports over 200 species of birds (Reclamation 2013).

The North Grasslands WA, managed by CDFW, is located approximately six miles north of Los Banos. It consists of 7,069 acres of wetlands, riparian habitat and uplands, which support Swainson's hawk and sandhill crane. The North Grasslands WA includes the China Island Unit, Galdwall Unit and Salt Slough Unit (Reclamation 2013).

Other Units

The Grasslands Resource Conservation District (GRCD) comprises approximately 60,000 acres of habitat land and is composed of privately-owned hunting clubs and other privately-owned wetland areas, as well as all or portions of several state wildlife areas (such as Volta WA, Los Banos WA including the Mud Slough Unit, the Gadwall and Salt Slough units of the North Grassland WA) and federal wildlife refuges (such as San Luis NWR).

Lands within the GRCD are primarily managed for waterfowl habitat. The Grasslands Water District (GWD) has a Water Management Plan, but no overall habitat management plan exists for the GRCD because of the large number of individual property owners. The management objectives of the GRCD include an active program to encourage natural food plant and habitat protection. Land uses include seasonally flooded wetlands, moist soil impoundments, permanent wetland, irrigated pasture, and croplands.

The GRCD contains most of the 51,530 acre GWD. The GWD is a legal entity that was established under section 34000 of the California Water Code to receive and distribute CVP water. The GWD delivers CVP water to the wetland areas within its boundaries. The GWD contains approximately 165 separate ownerships, most of which are duck clubs. Perpetual easements have been purchased by the USFWS to help preserve wetland-dependent migratory bird habitat on approximately 31,000 acres serviced by the GWD. These easements authorize the USFWS to restrict land uses that would diminish wetland habitat values.

Existing Land Uses

Direct impacts of project construction would be confined to Stanislaus County. The Land Use element of Stanislaus County's General Plan designates the proposed study area as Agriculture (Stanislaus County 1994). The sections below provide more detail as to the type of agriculture found along the two proposed project alternative alignments.

Alternative 1 – Combined Alignment Alternative

The pipeline from the Harding Drain Bypass Pipeline to the Jennings Plant Pump Station would begin at the corner of South Carpenter Road and West Harding Road and travel north along South Carpenter Road. Turning west onto West Main Street, the pipeline would continue along West Main Street and then run north onto Jennings Road. The pipeline would then traverse an agricultural field access road to reach

the southeastern edge of the Modesto's Jennings Wastewater Treatment Plant. Row crops dominate the agricultural land uses along these stretches of the pipeline.

The Jennings Plant Pump Station is located within the Modesto Jennings Plant, which is bounded to the west by the San Joaquin River, to the east by the Modesto Compost Facility, and to the north and south by agricultural plots. The pipeline would leave the WQCF at the southwestern edge and travel west across a riparian area and under the San Joaquin River, and through an agricultural access road to Lemon Avenue. Lemon Avenue crosses areas planted predominantly in row crops and orchards with some agricultural structures and rural residences. The pipeline turns south along SR 33, which is adjacent to orchards. Turning west onto Zacharias Road, the pipeline runs along Zacharias Road to the DMC. The agriculture along Zacharias Road is predominately orchards with some row crops and agricultural structures and rural residences. For most of this alignment, the pipeline would be constructed on County ROW.

Alternative 2 – Separate Alignment Alternative

Existing land use characteristics of Alternative 2 are similar to Alternative 1; land use along the portion of the pipeline from the Modesto Jennings Plant to the DMC is described above under Alternative 1. The new pump station would be located at the southwest corner of South Carpenter Road and West Harding Road. From there, the pipeline alignment traverses a riparian area, under the San Joaquin River, and through several row crop plots before meeting with Pomegranate Avenue. Pomegranate Avenue is dominated by row crops, agricultural structures, and rural residences. The pipeline then turns north up Locust Avenue, west along an agricultural access road before turning south along SR 33. This stretch of the pipeline is adjacent to orchards and has agricultural structures and a number of rural residences. From SR 33, the pipeline runs west along West Marshall Road before turning north on an agricultural access road and then west alongside an electrical substation.

Alternative 3 – PID Conveyance Alternative

Land use characteristics of Alternative 3 are similar to the two pipeline alignment alternatives. The pipeline would begin at the PID intake, which is an existing public use. The pipeline would be constructed within PID ROW, paralleling the PID Main Canal, and then run along Bartch Avenue to Ward Avenue. Land use along the PID Main Canal, Bartch Avenue and Ward Avenue is agricultural, with scattered rural residences.

Sensitive Receptors

Land uses such as residential, schools, day care centers, hospitals, and convalescent homes are considered to be more sensitive than the general public to certain environmental effects, and thus are collectively known as sensitive receptors. There are no schools, day care centers, hospitals, or convalescent homes within 1 mile of the proposed study area. While the proposed study area is not designated as residential in the Stanislaus County General Plan, there are rural residential homes scattered along the pipeline alignment.

3.13.2 Regulatory Framework

This section describes laws and regulations that may apply to the proposed project. There are no federal or state policies or programs regulating land use that would apply to the proposed project.

Local Policies and Regulations

The discussion of existing land use policies and regulations focuses on Stanislaus County, which is the location for all construction of new physical facilities.

Stanislaus County General Plan

The Stanislaus County General Plan guides development for the County within a 20-year planning horizon. The Land Use element of the County's General Plan designates the proposed study area as

Agriculture (Stanislaus County 1994). This classification is intended to "recognize the value and importance of agriculture by acting to preclude incompatible urban development within agricultural areas. It is intended for areas of land which are presently or potentially desirable for agricultural usage. These are typically areas which possess characteristics with respect to location, topography, parcel size, soil classification, water availability, and adjacent usage which, in proper combination, provide a favorable agricultural environment."

The following policies in the Stanislaus County General Plan, Land Use Element would apply to the project:

> *Policy Two*: Land designated Agriculture shall be restricted to uses that are compatible with agricultural practices, including natural resources management, open space, outdoor recreation and enjoyment of scenic beauty.
>
> *Policy Fourteen*: Uses shall not be permitted to intrude into or be located adjacent to an agricultural area if they are detrimental to continued agricultural usage of the surrounding area.
>
> *Policy Sixteen*: Agriculture, as the primary industry of the County, shall be promoted and protected.
>
> *Policy Twenty-Two*: Future growth shall not exceed the capabilities/capacity of the provider of services such as sewer, public safety, solid waste management, road systems schools, health care facilities, etc.

Stanislaus County Zoning Code

The Stanislaus County Zoning Code is designed to promote and protect the public health, safety, peace, morals, comfort, convenience, and general welfare of those living and working within Stanislaus County. The Zoning Code provides a general plan of development for the county, and serves to guide, control and regulate the future growth of the county in accordance with the county General Plan. The study area is zoned as A-2, that is, the study area is designed to support and enhance agriculture as the predominant land use. Uses and policies regarding the A-2 zone are intended to protect open space lands, and ensure that all land uses are compatible with agriculture and open space, including natural resources management.

City of Modesto Urban Area General Plan

The City of Modesto Urban Area General Plan serves as a blueprint for future growth within the City. The Plan outlines policies that focus on a community vision (City of Modesto 2008). The following policy in the Urban Area General Plan relating to land use and planning would apply to the project:

> *Overall Land Use Policy***:** Establish and maintain an orderly and compatible land use pattern. Evaluate land use compatibility, design compatibility, and the compatibility of lot size and configuration where new development is proposed within or adjacent to established neighborhoods, as well as noise, traffic, and environmental hazards when making land use decisions.

3.13.3 Impact Analysis/Environmental Consequences

Methodology for Analysis

This section evaluates whether construction and operation of the facilities associated with the proposed project would result in significant impacts related to land use. The analysis is based on a review of relevant local plans and aerial photography.

Thresholds of Significance

Consistent with Appendix G of the *CEQA Guidelines,* a land use and planning impact would be considered significant if the project would:

- Physically divide an established community or result in land use conflicts;
- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect;
- Conflict with any applicable habitat conservation plan or natural community conservation plan.

Criteria Requiring No Further Evaluation

Criteria listed above that are not applicable to actions associated with the proposed project are identified below along with a supporting rationale as to why further consideration is unnecessary and a no-impact determination is appropriate.

- *Conflict with any applicable habitat conservation plan or natural community conservation plan* – There is no adopted Habitat Conservation Plan or Natural Community Conservation Plan for the study area. Therefore, there would be no impact.

Impacts and Mitigation Measures

Impact LU-1 Physically Divide an Established Community or Result in Land Use Conflicts

Combined Alignment Alternative

The proposed project would not physically divide an established neighborhood or community because it would not occur within an urban or residential area and would not include construction of a roadway, wall, barrier, or other obstruction that would physically divide existing land uses. In addition, the proposed project would not permanently interfere with vehicular circulation of the neighborhood or community. The proposed pipelines would generally follow along existing roadways and would be buried underground once constructed. The pipelines may include aboveground air valves which would be housed on a concrete slab in a protective steel cage approximately 4 feet x 4 feet in dimension on the shoulder of the road. The repurposing of the Jennings Plant Pump Station would also not physically divide the community as the plant is already constructed and all repurposing activities would occur on pump station property owned by the City of Modesto.

All pipeline installation would occur within public roadways, private agricultural lands, and public open space areas. An easement from Caltrans would be required to construct the pipeline under SR 33. An access agreement may be required for railroad crossings. Project construction could temporarily impact roadway right-of-ways (ROWs), but these impacts would cease upon completion of construction and would not be anticipated to affect interaction within a neighborhood or community.

Separate Alignment Alternative

In addition to the impacts listed under the Combined Alignment Alternative, impacts would also include the construction of an additional pump station at the western end of the Harding Drain Bypass Pipeline. The City of Turlock owns this parcel, so no easements or other land acquisition would be needed. Construction of the additional pump station would not physically divide an established neighborhood or community because it would not include construction of a wall, barrier, or other obstruction that would physically divide existing land uses.

PID Conveyance Alternative

Impacts of pipeline construction would be similar to the Combined and Separate Alignment Alternatives, and would not physically divide a community or result in land use conflicts. Construction of the expanded PID intake and pump station would take place at the existing intake facility and would not physically divide an established neighborhood or community because it would not include construction of a wall, barrier, or other obstruction that would physically divide existing land uses.

No Action Alternative

If no action were taken, there would be no land use impacts within the study area.

Significance Determination before Mitigation

No impact for all action alternatives.

Mitigation Measures

No mitigation measures are required.

Impact LU-2 Conflict with Any Applicable Land Use Plan, Policy, or Regulation

Combined Alignment Alternative

The proposed project would be consistent with the Land Use element of the Stanislaus County General Plan. The General Plan states that "agriculture, as the primary industry of the County, shall be promoted and protected." The project would secure a reliable water source alternative to CVP water for agriculture use within the County. With this new water source, farmers could slow the rate of groundwater overdraft and preserve water within the region for later use. See *Chapter 3.2 Agriculture and Forestry Resources* for more information on agricultural impacts.

Separate Alignment Alternative

As described in *Chapter 2, Alternatives and Proposed Project/Action*, this alignment alternative would require construction of an additional pump station to be located at the corner of W. Harding Road and S. Carpenter Road. Land in this area is zoned A-2, indicating that public buildings or other facilities operated by political subdivisions are a Tier 3 use, which would require a use permit and approval from the Stanislaus County Planning Commission prior to development. Tier 3 uses are consistent with the A-2 Zone if (1) the use will not be substantially detrimental or in conflict with the agricultural use of other property in the vicinity and (2) the parcel on which the use is requested is not located in one of the County's most productive agricultural areas as defined in Stanislaus County's General Plan (Stanislaus County 1994). Once constructed, the proposed pump station would not interfere with agricultural uses within the vicinity. Similarly, because the pump station is located on less than 1 acre of land and helps to serve water to agricultural communities within Stanislaus County, it can reasonably be argued that the proposed use would still be consistent with the A-2 zone. As such, the proposed project would not conflict with any local land use plan, and any land use impacts would be less than significant.

PID Conveyance Alternative

The pipeline would be constructed in roads or in the existing PID ROW for the Main Canal. The expansion of the PID intake and construction of new pump would take place at PID's existing intake site. Thus, the proposed project would not conflict with any local land use plan, and any land use impacts would be less than significant.

No Action Alternative

If no action were taken, there would be no direct land use impacts within the study area. However, it is not unlikely that a lack of reliable water supply could result in a conversion of agricultural land to non-agriculture use. This would be a significant, and because mitigation would not be possible, potentially unavoidable adverse effect of the No Action Alternative.

Significance Determination before Mitigation

Less than significant for Alternatives 1, 2, and 3. Potentially significant and unavoidable for No Action Alternative.

Mitigation Measures

No mitigation measures are required for Alternatives 1, 2, and 3. No mitigation is possible for the No Action Alternative.

Cumulative Impacts

The geographic scope of potential cumulative impacts related to land use and planning is the study area. There are three relevant projects within the vicinity of the proposed project that may contribute to cumulative impacts:

- Jennings Treatment Plant Phase 2 Upgrades: increase tertiary treatment capacity by 12.6 MGD;
- West Main Improvement Project: widen West Main Ave to 3 lanes from the San Joaquin River to Crows Landing Road (Stanislaus County Department of Public Works 2011);
- StanCOG South Corridor Study: study potential alignments and corridor options for an expressway from the City of Turlock on the east to I-5 on the west (Stanislaus County Department of Public Works 2011).

Implementation of the proposed project, in conjunction with the projects listed above, would not create cumulative land use conflicts. The proposed project is consistent with all land use plans and would thus not have a cumulative impact related to land use planning conflicts. Facilities and infrastructure associated with the proposed project would either be buried underground or would be constructed in areas adjacent to other public infrastructure, and as such, would not create long-term cumulative impacts associated with dividing an established community.

3.13.4 References

Bureau of Reclamation (Reclamation). 2013. Refuge Recycled Water Supply Study, Volume I – Project Report. June.

Modesto, City of. 2008. Final Urban Area General Plan. October 14. Available at: https://www.modestogov.com/ced/pdf/planning/documents/general-plan/technical/Urban%20Area%20General%20Plan.pdf.

Stanislaus County. 1994. Stanislaus County General Plan. Available at: http://www.stancounty.com/planning/pl/general-plan.shtm

Stanislaus County Department of Public Works. 2011. Road to Success – Bridges to the Future, Fall 2011. Available at: http://www.stancounty.com/publicworks/pdf/cip-project-flyer.pdf

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3.14 Noise

This section addresses future noise impacts resulting from the implementation of the proposed project. Noise regulations for each jurisdiction are identified and summarized as they relate to specific components of the proposed project. This analysis assumes typical construction equipment noise levels to estimate corresponding noise levels at sensitive receptor locations and determines project significance based on local noise regulations and the CEQA Guidelines.

3.14.1 Environmental Setting/Affected Environment

Study Area

The study area for this section is the area surrounding the construction work areas required for pipeline installation and the pump stations. In general this is a rural area with few sensitive receptors. The pipeline is mainly located along roadways, in rural agricultural or undeveloped areas, or within existing developed areas such as the Jennings Treatment Plant, to which public access is limited.

Noise Principles and Descriptors

Noise Background

Noise is defined as unwanted sound. Sound, traveling in the form of waves from a source, exerts a sound pressure level (referred to as sound level) which is measured in decibels (dB), with zero dB corresponding roughly to the threshold of human hearing and 120 to 140 dB corresponding to the threshold of pain. Pressure waves traveling through air exert a force registered by the human ear as sound.

Sound pressure fluctuations can be measured in units of hertz (Hz) which correspond to the frequency of a particular sound. Typically, sound does not consist of a single frequency, but rather a broad band of frequencies varying in levels of magnitude (sound power). When all the audible frequencies of a sound are measured, a sound spectrum is plotted consisting of each measured Hz and corresponding sound power level. The audible sound spectrum consists of a range of frequency spanning 20 to 20,000 Hz. The sound pressure level, therefore, constitutes the additive force exerted by a sound corresponding to the sound frequency/sound power level spectrum.

The typical human ear is not equally sensitive to all frequencies of the audible sound spectrum (20 to 20,000 Hz). As a consequence, when assessing potential noise impacts, sound is measured using an electronic filter that de-emphasizes the frequencies below 1,000 Hz and above 5,000 Hz in a manner corresponding to the human ear's decreased sensitivity to low and extremely high frequencies instead of the frequency mid-range. This method of frequency weighting is referred to as A-weighting and is expressed in units of A-weighted decibels (dBA). Frequency A weighting follows an international standard method of frequency de-emphasis and is typically applied to community noise measurements. In practice, the level of a sound source is conveniently measured using a sound level meter that includes an electrical filter corresponding to the A-weighting curve. Some representative noise sources and their corresponding A-weighted noise levels are shown in **Table 3.14-1**. All of the noise levels reported herein are A-weighted unless otherwise stated.

Table 3.14-1: Typical A-Weighted Sound Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	— 110 —	Rock band
Jet fly-over at 1000 feet		
	— 100 —	
Gas lawn mower at 3 feet		
	— 90 —	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	— 80 —	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawn mower, 100 feet	— 70 —	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	— 60 —	
		Large business office
Quiet urban daytime	— 50 —	Dishwasher next room
Quiet urban nighttime	— 40 —	Theater, large conference room (background)
Quiet suburban nighttime		
	— 30 —	Library
Quiet rural nighttime		Bedroom at night, concert
	— 20 —	
		Broadcast/recording studio
	— 10 —	
Lowest threshold of human hearing	— 0 —	Lowest threshold of human hearing

Source: Caltrans 1998.

Noise Exposure and Community Noise

An individual's noise exposure is a measure of noise over a period of time. A noise level is a measure of noise at a given instant in time. The noise levels presented in **Table 3.14-1** are representative of measured noise at a given instant in time, however, they rarely persist consistently over a long period of time. Rather, community noise varies continuously over a period of time with respect to the contributing sound sources of the community noise environment. Community noise is primarily the product of many distant noise sources, which constitute a relatively stable background noise exposure, with the individual contributors unidentifiable. The background noise level changes throughout a typical day, but does so gradually, corresponding with the addition and subtraction of distant noise sources such as traffic and atmospheric conditions. What makes community noise constantly variable throughout a day, besides the slowly changing background noise, is the addition of short duration single event noise sources such as aircraft flyovers, vehicle pass-bys, and sirens, which are readily identifiable to the individual. These successive additions of sound to the community noise environment vary the community noise level from instant to instant, requiring the measurement of noise exposure over a period of time to legitimately characterize a community noise environment and evaluate cumulative noise impacts. This time-varying

characteristic of environmental noise is described using statistical noise descriptors. The most frequently used noise descriptors are summarized below:

L_{eq}: the equivalent sound level is used to describe noise over a specified period of time, typically one hour, in terms of a single numerical value. The L_{eq} is the constant sound level that would contain the same acoustic energy as the varying sound level, during the same time period (i.e., the average noise exposure level for the given time period).

L_{max}: the instantaneous maximum noise level for a specified period of time.

L_{dn}: 24-hour day and night A-weighed noise exposure level which accounts for the greater sensitivity of most people to nighttime noise by weighting noise levels at night ("penalizing" nighttime noises.) Noise between 10:00 p.m. and 7:00 a.m. is weighted (penalized) by adding 10 dBA to take into account the greater annoyance of nighttime noise.

Effects of Noise on People

The effects of noise on people can be placed in three categories:

- subjective effects of annoyance, nuisance, dissatisfaction;
- interference with activities such as speech, sleep, learning; and
- physiological effects such as hearing loss or sudden startling.

Environmental noise typically produces effects in the first two categories. Workers in industrial plants can experience noise in the last category. No completely satisfactory method exists to measure the subjective effects of noise, or the corresponding reactions of annoyance and dissatisfaction. A wide variation in individual thresholds of annoyance exists, and different tolerances to noise tend to develop based on an individual's past experiences with noise. Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted: the so called "ambient noise" level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it. With regard to increases in A-weighted noise level, the following relationships occur (Caltrans, 1998):

- Under controlled conditions in an acoustics laboratory, the trained, healthy human ear is able to discern changes in sound levels of 1 dBA;
- Outside of such controlled conditions, the trained ear can detect changes of 2 dBA in normal environmental noise;
- It is widely accepted that the average healthy ear, however, can barely perceive noise level changes of 3 dBA;
- A change in level of 5 dBA is a readily perceptible increase in noise level; and
- A 10 dBA change is recognized as twice as loud as the original source.

These relationships occur in part because of the logarithmic nature of sound and the decibel system. Sound level is measured in decibels. Because the decibel scale is based on logarithms, two noise sources do not combine in a simple linear fashion, but rather logarithmically. For example, if two identical noise sources produce noise levels of 50 dBA, the combined sound level would be 53 dBA, not 100 dBA.

Noise Attenuation

Stationary point sources of noise, including stationary mobile sources such as idling vehicles, attenuate (lessen) at a rate of 6 to 9 dBA per doubling of distance from the source, depending on environmental conditions (i.e., atmospheric conditions and noise barriers, either vegetative or manufactured). Widely distributed noises, such as a large industrial facility spread over many acres or a street with moving

vehicles (a "line" source), would typically attenuate at a lower rate, approximately 4 to 6 dBA per doubling of distance.

Vibration Background

Groundborne vibration propagates from the source through the ground to adjacent buildings by surface waves. Vibration may be composed of a single pulse, a series of pulses, or a continuous oscillatory motion. The frequency of a vibrating object describes how rapidly it is oscillating, measured in Hz. Most environmental vibrations consist of a composite, or "spectrum" of many frequencies. The normal frequency range of most groundborne vibrations that can be felt generally starts from a low frequency of less than 1 Hz to a high of about 200 Hz. Vibration information for this analysis has been described in terms of the peak particle velocity (PPV), measured in inches per second, or vibration level measured with respect to Root Mean Square (RMS) vibration velocity in decibels (VdB), with a reference quantity of 1 micro inch per second.

Vibration energy dissipates as it travels through the ground, causing the vibration amplitude to decrease with distance away from the source. High-frequency vibrations reduce much more rapidly than do low frequencies, so that in the far-field zone distant from a source, the low frequencies tend to dominate. Soil properties also affect the propagation of vibration. When groundborne vibration interacts with a building, usually a ground-to-foundation coupling loss occurs, but the vibration also can be amplified by the structural resonances of the walls and floors. Vibration in buildings typically is perceived as rattling of windows, shaking of loose items, or the motion of building surfaces. In some cases, the vibration of building surfaces also can be radiated as sound and heard as a low-frequency rumbling noise, known as groundborne noise.

Groundborne vibration generally is limited to areas within a few hundred feet of certain types of industrial operations and construction/demolition activities, such as pile driving. Road vehicles rarely create enough groundborne vibration amplitude to be perceptible to humans unless the receiver is in immediate proximity to the source or the road surface is poorly maintained and has potholes or bumps. Human sensitivity to vibration varies by frequency and by receiver. Generally, people are more sensitive to low-frequency vibration. Human annoyance also is related to the number and duration of events; the more events that occur or the greater the duration, the more annoying it becomes.

Existing Noise Environment

The existing noise environment in the project area is attributed to various stationary and mobile sources. These include noise originating from local vehicular and truck traffic and the operation of stationary sources (e.g., an existing tallow factory at the northeast corner of Harding Road and Carpenter Road) and mobile noise sources associated with local agricultural activities. Other, less prevalent, sources of noise that contribute to the existing noise environment in the project area site include landscaping activities (e.g., leaf blowing, lawn mowing) and regional roadway traffic.

Sensitive Receptors

Some land uses are considered more sensitive to ambient noise levels than others, due to the amount of noise exposure (in terms of both exposure duration and insulation from noise) and the types of activities typically involved. Residences, motels and hotels, schools, libraries, churches, hospitals, nursing homes, auditoriums, and parks and other outdoor recreation areas generally are more sensitive to noise than are commercial and industrial land uses. Sensitive receptors in the vicinity of the project alignment and pump stations include several rural residences. Installation of the pipeline would occur almost entirely within County road and drainage and irrigation canal ROW. In some instances, the pipeline could be installed within 50 feet of an existing residence.

3.14.2 Regulatory Framework

Federal Policies and Regulations

Federal regulations establish noise limits for medium and heavy trucks (more than 4.5 tons, gross vehicle weight rating) under 40 CFR, Part 205, Subpart B. The federal truck pass-by noise standard is 80 dBA at 15 meters from the vehicle pathway centerline. These controls are implemented through regulatory controls on truck manufacturers.

State Policies and Regulations

The State of California establishes noise limits for vehicles licensed to operate on public roads. For heavy trucks, the State pass-by standard is consistent with the federal limit of 80 dBA. The State pass-by standard for light trucks and passenger cars (less than 4.5 tons, gross vehicle rating) is also 80 dBA at 15 meters from the centerline. These standards are implemented through controls on vehicle manufacturers and by legal sanction of vehicle operators by state and local law enforcement officials.

The State has also established noise insulation standards for new multi-family residential units, hotels, and motels that would be subject to relatively high levels of transportation-related noise. These requirements are collectively known as the California Noise Insulation Standards (Title 24, California Code of Regulations). The noise insulation standards set forth an interior standard of L_{dn} 45 dBA in any habitable room. They require an acoustical analysis demonstrating how dwelling units have been designed to meet this interior standard where such units are proposed in areas subject to noise levels greater than L_{dn} 60 dBA. Title 24 standards are typically enforced by local jurisdictions through the building permit application process.

Local Policies and Regulations

Local regulation of noise involves implementation of General Plan policies and Noise Ordinance standards. Local General Plans identify general principles intended to guide and influence development plans, and Noise Ordinances set forth the specific standards and procedures for addressing particular noise sources and activities. General Plans recognize that different types of land uses have different sensitivities toward their noise environment; residential areas are generally considered to be the land use most sensitive to noise and industrial/commercial areas are generally considered to be the least sensitive. Local noise ordinances typically set forth standards related to construction activities, nuisance-type noise sources, and industrial property line noise levels. Noise regulations and standards that apply to the land uses within the unincorporated portions Stanislaus County are provided below.

Stanislaus County Noise Ordinance

The Stanislaus County Noise Ordinance (Title 10 Chapter 10.46 Noise Control) establishes exterior noise level standards shown in **Table 3.14-2**. While these generally apply to operations, there is an exemption for construction or maintenance activities performed by or at the direction of any public entity or public utility. The noise ordinance also has limits for construction equipment during the hours of 7 p.m. to 7 a.m. which requires noise levels to be below 75 dBA during these hours.

Table 3.14-2: Exterior Noise Level Standards

Designated Noise Zone	Maximum A-weighted Sound Level (L_{max})	
	7:00 A.M. to 9:59 P.M.	10:00 P.M. to 6:59 A.M.
Noise Sensitive	45	45
Residential	50	45
Commercial	60	55
Industrial	75	75

Stanislaus County vibration ordinance prohibits operation of any device that creates vibration that is above the vibration perception threshold, which is defined to be a measured motion velocity of 0.01 in/sec over the range of one to one hundred Hertz. While these generally apply to operational vibration, there is an exemption for construction or maintenance activities performed by or at the direction of any public entity or public utility.

City of Modesto General Plan

The Modesto General Plan does not include any noise policies relevant to the proposed project.

City of Modesto's Municipal Code

Section 4.9-103 (Enumerations) of the City of Modesto's municipal code states that use of heavy equipment (e.g., bulldozers, road graders, backhoes, etc.), construction, demolition or other activities that result in loud and raucous operations before 7:00 a.m. or after 9:00 p.m. are declared as public nuisances. However, per Section 4-9.104 (Exemptions) of the City's municipal code, activities on or in publicly owned property are exempt from the City of Modesto's noise requirement. Because the Jennings Plant outfall pump station is on publicly owned property, proposed activities at this location would be exempt from Section 4.9-103.

3.14.3 Impact Analysis/Environmental Consequences

Methodology for Analysis

Noise

Construction noise sources would include a variety of heavy equipment and other machinery. The Federal Transit Administration (FTA) has established guidance on noise and vibration impact assessments for construction equipment (FTA 2006). The FTA recommends that for a rough estimate of construction noise levels that the noisiest two pieces of equipment be used to analyze the anticipated noise levels at sensitive receptors assuming the following:

- full power operation for a full one hour is assumed,
- there are no obstructions to the noise travel paths,
- typical noise levels from construction equipment are used, and
- all pieces of equipment are assumed to operate at the center of the proposed project area.

Using these simplifying assumptions, the noise levels at specific distances can be obtained using the equations provided in the FTA guidance (FTA 2006).

The estimated noise levels are compared to the noise emission limits established by Stanislaus County. While the above calculations apply to construction equipment, truck traffic to and from the construction sites could also have the potential to create additional noise for residences and commercial establishments located along haul routes.

Vibration

Construction activity associated with the operation of heavy equipment and vibratory pile driving may generate localized groundborne vibration and noise. However, vibration from ground-disturbing construction activity is typically below the threshold of perception when the activity is more than 50 feet from the receiver. The impact of the vibratory pile driving can potentially impact nearby buildings and sensitive receptors. Based on methods and equations described by FTA (FTA 2006), the vibration levels in terms of peak particle velocity at specific distances can be obtained.

Using the most sensitive building types and land use categories the peak PPV would have to exceed 0.12 in/sec and L_{eq} would have to exceed 65 VdB in order to result in any building damage or vibrational

disturbances. For industrial buildings the PPV would have to exceed 0.5 in/sec in order to result in any building damage or vibrational disturbances (Caltrans 2013).

Thresholds of Significance

Consistent with Appendix G of the *CEQA Guidelines*, a noise impact would be considered significant if the project would cause:

- Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
- Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.
- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.
- For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, exposure of people residing or working in the project area to excessive noise levels
- For a project within the vicinity of a private airstrip, exposure of people residing or working in the project area to excessive noise levels.

Criteria Requiring No Further Evaluation

Criteria listed above that are not applicable to actions associated with the project are identified below along with supporting rationale as to why further consideration is unnecessary and a no-impact determination is appropriate.

- *Aircraft noise* - Because the project is not located near an airport or airstrip, people working in the project area would not be exposed to noise from airports and airstrips.

Impacts and Mitigation Measures

Impact NOISE-1 Temporary Construction-Related Noise Increases

Combined Alignment Alternative

Under the combined alignment alternative, construction activities would occur in several phases with unique construction equipment lists and in multiple locations. For calculation of noise impacts, construction activities were grouped as applicable to the following locations: Weir Structure, Pump Station, Pipeline (except San Joaquin River crossing), and San Joaquin River Crossing. The construction phase at each of these locations that had the two noisiest pieces of equipment was used to estimate the A-weighted noise impacts shown in **Table 3.14-3**.

Table 3.14-3: Construction Noise Levels

Construction Location	Equipment Type	Typical Noise Level 50 feet from Source (dBA)	Distance to Meet Daytime Exterior Noise Standard (Feet)			
			Sensitive (45dBA)	Residential (50dBA)	Commercial (60 dBA)	Industrial (75dBA)
Weir Structure	Concrete Saws	90	10,200	5,736	1,813	323
	Tractors/Loaders/ Backhoes	85				
Pump Station	Excavator	85	7,071	3,976	1,257	224
	Bulldozer	85				
Pipeline	Rubber Tired Dozers	85	7,071	3,976	1,257	224
	Tractors/Loaders/ Backhoes	85				
San Joaquin River Crossing	Vibratory or Impact Pile Driver	95[1]	16,583	9,325	2,949	524
	Bulldozer	85				

[1]See *Section 4, Biological Resources*, for analysis of noise effects on fish and wildlife. Source: FHWA 2006; FTA 2006, Appendix C

According to **Table 3.14-4** the exterior noise threshold of 50 dBA would be achieved for residential receptors located 3,976 to 9,325 feet or further from the construction area depending on the specific construction phase. For the pump stations there is a residence located to the east of the pump station that is 3,760 feet from the Modesto pump station and may experience some noise above 50dBA, but no sources would be above 75dBA. Three residences would experience levels above 50 dBA from construction of the Modesto Weir. Numerous residences are adjacent to the pipeline alignment and would experience levels above 50dBA for the short time when pipeline construction activity is being conducted near a particular residence before moving further along the pipeline alignment. Numerous residences would also be affected during the San Joaquin River Crossing phase due largely to the pile driving activity, which is scheduled to occur for 2 months, with noise levels decreasing for construction of the trenchless crossings using HDD or microtunneling during the remainder of the construction phase.

While the Stanislaus County Noise Ordinance exempts public entities and utilities, the noise levels at residences near the construction activity could result in annoyance and thus noise generated by project construction could be potentially significant.

In order to address noise annoyance that sensitive receptors and residents may experience, **Mitigation Measure NOISE-1** will be implemented. While not all of the mitigation measure components are measureable, this mitigation measure will result in some reduction in noise levels. For instance, the use of mufflers typically can reduce levels by 5 to 10 dBA (USEPA 1971) and additional reductions would occur with the use of any sound barriers or obstructions. Since the County Noise Ordinance exempts this type of construction activity from the noise threshold and appropriate measures have been implemented to reduce levels, the noise levels after mitigation would be considered to be less than significant.

Separate Alignment Alternative

Similar to the combined alignment alternative, construction activities were grouped for calculation of noise impacts as applicable to the following locations: Weir Structure, Pump Station, Pipeline (except San Joaquin River crossing), and San Joaquin River Crossing. The construction phase at each of these

locations that had the two noisiest pieces of equipment was used to estimate the A-weighted noise impacts shown in **Table 3.14-3**. Since similar types of equipment are used in the combined and separate alignment alternatives, the two noisiest pieces of equipment are the same for a given construction phase type and only the location of sensitive receptors near the construction site changes.

According to **Table 3.14-3** the exterior noise threshold of 50 dBA would be achieved for residential receptors located 3,976 to 9,325 feet or further from the construction area depending on the specific construction phase. A residence is located 3,760 feet from the Modesto pump station and may experience some noise above 50dBA. Several residences are located closer than 3,976 feet from the Turlock pump station site that would experience construction noise levels above 50 dBA, but no sources would be above 75dBA. Three residences would experience levels above 50 dBA from construction of the Modesto Weir and about 12 residences would experience levels above 50 dBA from construction of the Turlock Weir. Numerous residences are adjacent to the pipeline alignment and would experience levels above 50dBA for the short time when pipeline construction activity is being conducted near a particular residence before moving further along the pipeline alignment. Numerous residences would be affected during the two San Joaquin River Crossings due largely to the pile driving activity, which is scheduled to occur for only 2 months with noise levels decreasing for the remainder of the construction phase.

While the Stanislaus County Noise Ordinance exempts public entities and utilities, the noise levels at residences near the construction activity could result in annoyances and thus noise generated by project construction could be potentially significant.

In order to address some of the noise annoyance that sensitive receptors and residents may experience, **Mitigation Measure NOISE-1** will be implemented. While not all of the mitigation measure components are measureable, this mitigation measure will result in some reduction in noise levels. For instance the use of mufflers typically can reduce levels by 5 to 10 dBA (USEPA 1971) and additional reductions would occur with the use of any sound barriers or obstructions. Since the County Noise Ordinance exempts this type of construction activity from the noise threshold and appropriate measures have been implemented to reduce levels, the noise levels after mitigation would be considered to be less than significant.

PID Conveyance Alternative

Noise impacts for construction of the weir structure, pump station, and pipeline would be expected to be the same as for the Combined and Separate Alignment Alternatives, and are shown in **Table 3.14-3**. Since similar types of equipment are used for these elements of all alternatives, the two noisiest pieces of equipment are the same for a given construction phase type and only the location of sensitive receptors near the construction site changes. There are several rural residences located along the pipeline alignment, both along the PID Main Canal, and along Bartch and Ward Avenues, but pipeline construction would only affect any individual residence for a short period of time. There is a residence about ½ mile from the weir structure on the DMC, which would experience noise levels above 50 dBA.

In addition, the PID Conveyance Alternative would require expansion of the existing PID intake facility. Noise impacts of construction would be similar to the impacts of constructing the existing diversion and fish screen. The noisiest construction activity for the intake would be pile driving for construction of the cofferdam, which is estimated to be 95 dBA at a distance of 50 feet. The nearest residence is located about 500 feet southwest of the intake, and could experience noise levels of 74 dBA during pile driving (PID 2006). As stated above, the Stanislaus County Noise Ordinance exempts public entities and utilities, but the noise levels at residences near the construction activity could result in annoyances and thus noise generated by project construction could be potentially significant.

In order to address some of the noise annoyance that sensitive receptors and residents may experience, **Mitigation Measure NOISE-1** will be implemented. Because the County Noise Ordinance exempts this

type of construction activity from the noise threshold and appropriate measures have been implemented to reduce levels, the noise levels after mitigation would be considered to be less than significant.

No Action Alternative

Under the no action alternative, no construction would occur, and therefore there would be no noise impacts.

Significance Determination before Mitigation

Potentially significant for all action alternatives.

Mitigation Measures

Mitigation Measure NOISE-1: Noise Reduction Measures (Alternatives 1, 2, and 3)

To reduce the impact of noise from construction activities the following measures shall be implemented to the extent feasible:

- Construction activities shall be limited to the hours of 7:00 am to 7:00 pm, Monday to Friday.
- Construction staging areas shall be as far as possible from existing residences.
- Construction equipment noise shall be minimized during project construction by muffling and shielding intakes and exhaust on construction equipment per the manufacturers' specifications and by shrouding or shielding impact tools. All equipment shall have sound-control devices no less effective than those provided by the manufacturer.
- All stationary noise generating construction equipment shall be placed as far away as possible from sensitive receptors on in an orientation minimizing noise impacts (e.g. behind barriers or storage piles).

Significance Determination after Mitigation

Less than significant.

Impact NOISE-2 Temporary Disturbance from Construction-Related Vibration

Combined Alignment Alternative

Vibrational impacts from construction could mainly occur from the vibratory pile drivers used at the San Joaquin River crossing. Vibrations from the rest of the construction equipment would typically be below the PPV threshold of 0.01 inches per second at 182 feet. The estimated PPV during the San Joaquin River crossing during pile driving activities is based on a reference PPV for vibratory pile drivers at 25 feet of 0.65 inches per second (Caltrans 2013). This was used to estimate the minimum distance a structure would have to be from the pile driving activity to experience 0.01 inch per second. Any structures or sensitive receptors closer than 1,112 feet to the San Joaquin river crossing would experience vibrations greater than the threshold. There are no sensitive receptors or structures located within a 1,112-foot radius of the Modesto crossing and thus the impact from vibrations would be less than significant.

Separate Alignment Alternative

Impacts for the Modesto crossing would be as described above for the combined alignment alternative.

For the Turlock crossing, an industrial area with several buildings located nearby may experience vibrations above the threshold, which may cause annoyance for workers at this location. However, vibration levels would be less than 0.5 inches per second (Caltrans 2013), which is the threshold to cause damage to industrial buildings. These vibration levels would not cause any building damage and would cause only temporary annoyance for people working near the activities. In addition the County of

Stanislaus vibration ordinance exempts this type of temporary construction activity from lower annoyance thresholds. Therefore, the impact from vibrations would be less than significant.

PID Conveyance Alternative

Vibration impacts from construction would mainly be associated with pile driving that would be needed for expansion of the PID intake facility. There is a residence located about 500 feet from the intake site that could experience vibrations above the threshold, which may cause annoyance for residents at this location. However, vibration levels would not be expected to be greater than those experienced during construction of the existing intake, which was not expected to damage nearby structures (PID 2006). Vibration levels are not expected to cause damage, and would cause only temporary annoyance for nearby receptors. In addition, the County of Stanislaus vibration ordinance exempts this type of temporary construction activity from the 0.01 inches per second threshold. Therefore, the impact from vibrations would be less than significant.

No Action Alternative

There would be no construction and therefore no vibration impacts.

Significance Determination before Mitigation

Less than significant for all action alternatives.

Mitigation Measures

No mitigation required.

Impact NOISE-3 Increase in Ambient Noise Due to Operational Noise and Vibration

Combined Alignment Alternative

Operation of the modified pump station would result in the generation of noise from pump machinery. Land use surrounding the proposed site of the pump station beyond the wastewater treatment plant is agricultural with some residences located 3,760 feet from the proposed site. The pump station would use 500-horsepower pumps. Given that the pump station would be housed within an enclosed structure, and considering the distance to the nearest sensitive receptors, noise generated by the pump station would generally correspond to existing noise levels, especially since it already has an existing pump station that would be repurposed. Therefore, the impact is less than significant.

Separate Alignment Alternative

Operation of the pump stations would result in the generation of noise from pump machinery. Land use surrounding the proposed sites of the pump stations include the Jennings Plant, agricultural uses, and some residences located 3,760 and 1,660 feet from the proposed site for the Modesto and Harding Drain Pump Stations, respectively. At build-out, the pump stations would consist of 300 and 250 horsepower pumps for the Modesto and Harding Drain Pump Stations, respectively. Given that the pump stations would be housed within an enclosed structure in conjunction with the distances to the nearest sensitive receptors, noise generated by the new pump station would generally correspond with existing noise levels. Therefore, the impact is less than significant.

PID Conveyance Alternative

Operation of the new pump station at the PID intake would result in the generation of noise from pump machinery. Land use surrounding the proposed site of the pump station beyond the wastewater treatment plant is agricultural with one rural residence located about 500 feet from the existing intake site. Noise generated by the pump station, which would be housed within an enclosed structure would generally correspond to existing noise levels, especially since there is already an existing pump station at the site. Therefore, the impact is less than significant.

No Action Alternative

Under the no action alternative, treated waste water would continue to discharge to the San Joaquin River or applied to land, and there would be no additional operational noises or vibration. Therefore there would be no noise impacts.

Significance Determination before Mitigation

Less than significant for all action alternatives.

Mitigation Measures

No mitigation required.

Impact NOISE-4 Cumulative Noise and Vibration Impacts

Combined Alignment Alternative

Temporary increases in ambient noise and vibration levels during installation of the proposed project facilities would not be cumulatively considerable given the short-term nature of the impacts. Over the long term, the noise impact from the proposed project would be negligible and not cumulatively considerable, given that it would include operation of pumps in an enclosed structure and very infrequent motor vehicle trips associated with maintenance activities.

Separate Alignment Alternative

Temporary increases in ambient noise and vibration levels during installation of the proposed project facilities would not be cumulatively considerable given the short-term nature of the impacts. Over the long term, the noise impact from the proposed project would be negligible and not cumulatively considerable, given that it would include operation of pumps in an enclosed structure and very infrequent motor vehicle trips associated with maintenance activities.

PID Conveyance Alternative

Temporary increases in ambient noise and vibration levels during installation of the proposed project facilities would not be cumulatively considerable given the short-term nature of the impacts. Over the long term, the noise impact from the proposed project would be negligible and not cumulatively considerable, given that it would include operation of pumps in an enclosed structure on a site with existing pumps and very infrequent motor vehicle trips associated with maintenance activities.

No Action Alternative

Under the no action alternative there would be no additional operational noises or vibration. Therefore, there would be no cumulatively considerable impact.

Significance Determination before Mitigation

Not cumulatively considerable and therefore less than significant for all action alternatives.

Mitigation Measures

No mitigation required.

3.14.4 References

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3.15 Population and Housing

This section describes the population and housing of the study area, and the relevant regulatory setting. This section also evaluates the potential for the proposed project to affecting population and housing.

3.15.1 Environmental Setting/Affected Environment

Population

The DPWD service area encompasses lands within Stanislaus County, San Joaquin County, and Merced County, in the San Joaquin Valley. Proposed facilities will be located entirely within Stanislaus County, and recycled water would be used within DPWD's service area in all three counties. According to the Housing Element of the Stanislaus County General the Plan, the population of the unincorporated limits of Stanislaus County rose from 95,756 in 1990 to 106,741 in 2000, an increase of 11.3 percent from 1990. The overall growth rate from 1990 to present has remained below 1.5 percent. The 2012 population was 114,712, which represents a percent change of approximately 0.4% during that time period (County of Stanislaus, 2012). The population of the unincorporated and incorporated areas has risen from 510,694 in July 2008 to 525,491, an approximately 2.8 percent increase since 2008 (County of Stanislaus, 2012 and U.S. Census Bureau, 2014a). According to the Housing Element, most of the future residential growth in Stanislaus County is projected to occur within the limits of the incorporated cities as historically experienced. Any concentrated growth in unincorporated Stanislaus County is anticipated to take place in communities of Denair, Diablo Grande, Keyes and Salida, which are guided by community plans and are served by special districts that provide sewer and water systems necessary to accommodate development (County of Stanislaus, 2012).

The population of San Joaquin County grew from 563,598 to 686,660 residents from 2000 to 2008. The annual average population growth rate during that period was equivalent to 2.7 percent, with the incorporated population occurring at a higher rate (3.1 percent) than the unincorporated area (1.4 percent) (County of San Joaquin 2011). According to the U.S. Census, the 2013 estimated population for 2010 and 2013 are 685,308 and 704,379, respectively, or a population change of approximately 2.8 percent between 2010 and 2013 (US Census Bureau, 2014b).

The population of Merced County increased from 210,554 in 2000 to 255,793 in 2010, , a growth rate of approximately 22 percent during that period. According to the U.S. Census, the estimated population in 2013 is 263,228, which represents a population change of approximately 2.9 percent between 2010 and 2013 (US Census Bureau, 2014c).

Housing

According to the Stanislaus County Housing Element, household growth between 1990 and 2000 increased at a greater rate throughout the County as a whole than it did in the unincorporated areas. The households in 1990 and 2000 in unincorporated areas are 30,961 and 32,646, an annual percent change of 0.5 percent compared to 1.2 percent Countywide. This was attributed to greater occurrence of multi-family rental units within the incorporated cities where services and infrastructure are more readily available (County of Stanislaus, 2012). Housing units in 2013 were 179,683 (U.S. Census Bureau, 2014b).

From 2000 to 2008, San Joaquin County experienced historically high rates of housing growth, with incorporated areas growing slightly faster than unincorporated areas (2.67 percent compared to 1.25 percent). Growth within the cities is possibly related to the trend that has occurred over the last several decades of an influx of Bay Area workers seeking more affordable housing in San Joaquin County. In 2013 there were 235,943 housing units (U.S. Census Bureau, 2014b).

In Merced County, the average household growth rate from 2000 to 2006 was 18.5 percent, with the number of household units growing from 68,373 in 2000 to 81,058 in 2006 (U.S. Census Bureau 2000; 2006). The growth rate slowed to 3.1% from 2006 to 2012, with the number of household units totaling 83,571 in 2012 (U.S. Census Bureau 2012). In 2013, there were 83,840 housing units (U.S. Census Bureau, 2014c).

3.15.2 Regulatory Framework

This section describes laws and regulations that may apply to the proposed project.

Federal Policies and Regulations

There are no federal regulations associated with population and housing that are relevant to the proposed project.

State Policies and Regulations

There are no state regulations associated with population and housing that are relevant to the proposed project.

Local Policies and Regulations

Stanislaus County General Plan

The Land Use Element of the Stanislaus County General Plan provides guidance on the County's growth (County of Stanislaus, No Date).

GOAL THREE: Foster stable economic growth through appropriate land use policies.

> Policy Twenty-two: Future growth shall not exceed the capabilities/capacity of the provider of services such as sewer, water, public safety, solid waste management, road systems, schools, health care facilities, etc.

San Joaquin County General Plan

The San Joaquin County General Plan provides guidance on the County's growth (County of San Joaquin General Plan, 2010).

> *Objective 1:* To ensure that there is an adequate amount of land planned for urban development to accommodate the projected population growth in areas where the appropriate level of services are or can be made available.
>
> *Objective 7:* To provide public facilities and services to meet needs in an efficient and cost-effective manner.

Merced County General Plan

The Merced County General Plan provides guidance on the County's growth and development (County of Merced, 2013).

> *Policy LU-1.1.* Countywide Development. Direct urban development to areas within urban boundaries of cities, Urban Communities, and Highway Interchange Centers in order to preserve productive agriculture, limit urban sprawl, and protect natural resources.
>
> *Policy LU-1.2.* Rural Centers. Limit the amount of new growth within existing Rural Centers by allowing only agriculture-supporting residential and commercial uses.
>
> *Policy LU-1.3.* Rural Residential Centers. Limit the amount of new growth within existing Rural Centers by allowing only residential uses, limiting public services, and prohibiting commercial uses.

Policy LU-1.5. New Urban Communities. Consider the establishment of new Urban Communities in areas off of productive agricultural land which satisfy the policy requirements under Goal LU-5.F, in order to accommodate projected future growth.

Policy LU-1.10. Orderly Community Growth. Require the orderly, well planned, and balanced growth of the incorporated communities consistent with the limits imposed by local infrastructure, services, public facilities, and their ability to assimilate growth.

City of Modesto Urban Area General Plan

The City of Modesto Urban Area General Plan serves as a blueprint for future growth within the City. The Plan outlines policies that focus on a community vision (City of Modesto 2008). The following policy in the Housing Element of the Urban Area General Plan relating to population and housing would apply to the project:

Policy 6.1: Promote coordination between infrastructure master plans, service area boundaries, and housing plans to ensure that adequate services are available to serve expected housing growth. Direct housing to areas where infrastructure and utilities can be provided commensurate with housing population.

3.15.3 Impact Analysis/Environmental Consequences

Methodology for Analysis

This section evaluates whether construction and operation of the facilities associated with the proposed project would result in significant impacts related to population and housing.

Thresholds of Significance

Consistent with Appendix G of the *CEQA Guidelines,* an impact on population and housing would be considered significant if the project would:

- Displace substantial numbers of housing units, necessitating the construction of replacement housing elsewhere; or
- Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere.

Criteria Requiring No Further Evaluation

Criteria listed above that are not applicable to actions associated with the proposed project are identified below along with a supporting rationale as to why further consideration is unnecessary and a no-impact determination is appropriate.

- *Displace substantial numbers of housing units* – The proposed project would be confined primarily to land owned by the Cities of Modesto and Turlock and to existing roadways and adjacent right-of-way and would not require the demolition of existing residential houses. As a result, the proposed project would not displace existing housing.
- *Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere.* The proposed project construction activities would be confined to land owned by the Cities of Modesto and Turlock and to existing roadways and adjacent right-of-way and would not remove any housing. As a result, the proposed project would not displace people.

3.15.4 References

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United States Census Bureau. 2014c. State and County Quick Facts – Merced County, California. Last amended July 8. Available at: http://quickfacts.census.gov/qfd/states/06/06047.html

3.16 Public Services and Utilities

This section presents the physical and regulatory setting for public services and utilities surrounding the proposed NVRRWP project. The impact analysis considers the potential for the proposed project to exceed the existing capacities for public services (i.e., police, fire, schools, and parks) and utilities (i.e., water, wastewater, storm drainage, solid waste, and electrical services). The analysis is based on a review of local land use plans and policies and aerial imagery.

3.16.1 Environmental Setting/Affected Environment

The study area for the analysis is Stanislaus County, which provides public services to the area in which the proposed project facilities would be constructed. This section describes the environmental setting for current public services and utilities within the study area. From the DMC, the proposed project would also supply water to users in Merced and San Joaquin Counties, but because there are no facilities there, no effects on services or utilities in those areas are expected.

Police Services

The Stanislaus County Sheriff's Department provides police services for the proposed project area. The Department has a Sheriff, an Undersheriff, two Captains, four Chiefs, two Sergeants, and ten Lieutenants, as well as a number of officers (Stanislaus County Sheriff's Department 2014a). Patrol Services is responsible for responding to citizen calls and is expected to investigate crime, make arrests, provide preventative patrol, and render assistance as needed. Patrol Services includes specialty units including the K-9 Unit, the Mounted Unit, and SWAT. The Investigations Division is responsible for the follow-up of major crimes that are reported to the Department. The Sheriff's Department provides contractual law enforcement services to the cities of Riverbank, Patterson, Waterford, and Hughson (Stanislaus County Sheriff's Department 2014b).

Fire Services

Fire protection services within the proposed project area are provided by the West Stanislaus County Fire Protection District (WSCFD), the Westport Fire Protection District (WFPD), and the Mountain View Fire Protection District (MVFPD).

The WSCFD serves roughly 625 square miles west of the San Joaquin River in Stanislaus County, excluding the cities of Patterson and Newman. The WSCFD serves the portions of both Alternative 1 and Alternative 2 that are west of the San Joaquin River. There are five stations, two of which are jointly shared with the cities of Newman and Patterson. District Headquarters are located at 244 West Las Palmas Avenue in Patterson. The District has eight staff and 85 volunteers and provides fire, EMS, and rescue services (West Stanislaus County Fire Protection District 2014. Apparatus includes 8 engines, 4 water tenders, 3 rescue vehicles, 1 electric unit, 1 air unit, 4 command vehicles, and 1 truck (West Stanislaus County Fire Protection District 2014). In 2010, the District responded to 120 fires, 280 rescue/medical calls, and 236 other incidents (West Stanislaus County Fire Protection District 2014).

The WFPD serves 45 square miles, including a small portion of the eastern edge of Alternative 1. There is one station located at 5160 South Carpenter Road in Modesto. There are 17 volunteers on staff with access to 2 engines, 1 water tender, and 1 rescue vehicle (Stanislaus LAFCO 2007). Services include fire, EMS, and rescue. Roughly 300 incidents were reported in 2005 (Stanislaus LAFCO 2007).

The MVFPD serves 53 square miles, including a portion of Alternative 2 east of the San Joaquin River. The MVFPD has two stations and is headquartered at 9633 Crows Landing Road in Crows Landing. The MVFPD has 18 volunteer staff with 3 engines and 1 water tender; services include fire, EMS, and rescue (Stanislaus LAFCO 2007). In 2005, MVFPD reported less than 200 incidents (Stanislaus LAFCO 2007).

Other Emergency Services

The Stanislaus County Emergency Medical Services Committee is tasked with coordinating and regulating local emergency service for Stanislaus County (Mountain Valley Emergency Medical Services Agency 2013). Committee members are appointed by the Stanislaus County Board of Supervisors and serve three year terms. The Committee is responsible for recommending optimal EMS dispatch and EMS first response configurations for the County, evaluating the need for policy development, recommending optimal emergency ambulance service areas, recommending guidelines for an EMS disaster plan, and evaluating EMS education levels.

Water Supply

West Stanislaus Irrigation District (WSID) serves the mid-portion of Alternative 1 which runs east-west from Interstate 5 to SR 33. WSID provides water for irrigation purposes to its customers. The District operates and maintains an intake canal along the San Joaquin River for its diversions. WSID also has a contract for Central Valley Project (CVP) water from the DMC.

Turlock Irrigation District (TID) serves the southeastern portion of Alternative 2, including the proposed pump station located at the corner of S. Carpenter Road and W. Harding Road (Stanislaus LAFCO 2009/2011). TID provides irrigation water to more than 5,800 growers in a 307 square mile service area with 149,500 acres of farmland. TID water is stored in Don Pedro Reservoir, and is conveyed by gravity to its service area.

Patterson Irrigation District (PID) serves the portion of Alternative 1 that runs from west of the San Joaquin River to SR 33. Patterson Irrigation District (PID) also serves the portion of Alternative 2 that runs along Pomegranate Ave. south of the City of Patterson to SR 33. Serving nearly 13,500 acres of farmland and ranches with irrigation water, PID diverts water from the San Joaquin River and has a contract for CVP water from the DMC.

Delta Puerto Water District (DPWD) serves the remainder of the proposed project, including between Rogers Road along Zacharias Avenue to where Alternative 1 connects with the DMC and between SR 33 and along Marshall Road to where Alternative 2 connects with the DMC. Serving agricultural irrigation water to roughly 45,000 acres of farmland, DPWD's primary source of water is through a contract with the United States for up to 140,210 AF annually from the CVP.

Wastewater

The majority of unincorporated Stanislaus County, including the study area, is not provided sewer services by a wastewater entity, as rural residences rely on septic systems.

Solid Waste

The Environmental Resources Department of Stanislaus County provides solid waste management services to the study area (Stanislaus County 2013). These services include administering the Refuse Control Ordinance, preparing educational outreach materials, promoting beverage container and waste motor oil recycling, and administering the four refuse collection agreements for the unincorporated areas of Stanislaus County. Bertolotti Disposal Company is the contracted entity that collects solid waste within the study area.

Collected waste and recyclables are transported to the Bertolotti Disposal and Transfer Station at 231 Flamingo Drive in Ceres. From the Transfer Station, all non-recycled waste items are transported to the Fink Road Sanitary Landfill located at 4000 Fink Road in Crows Landing. Opened in 1973, the Fink Road Landfill is owned by Stanislaus County and operated by the Environmental Resources Department (Stanislaus County 2014). It provides landfill services to the cities of Ceres, Hughson, Modesto, Newman, Oakdale, Patterson, Riverbank, Turlock, Waterford, and the unincorporated areas of Stanislaus County.

3.16.2 Regulatory Framework

This section describes laws and regulations that may apply to the proposed project.

Federal Policies and Regulations

Uniform Crime Reporting Program (UCR)

The Federal Bureau of Investigation currently collects information on over 14,000 law enforcement agencies across the nation through the UCR. The UCR defines law enforcement officers as individuals who ordinarily carry a firearm and a badge, have full arrest powers, and are paid from governmental funds set aside specifically for sworn law enforcement representatives. While the UCR records number of law enforcement officers per 1,000 inhabitants, there are currently neither national requirements nor recommendations for staffing level ratios. The national average of sworn officers per 1,000 inhabitants was 2.4 in 2011, with the highest in cities with fewer than 10,000 residents.

Federal Safe Drinking Water Act (SDWA)

The SDWA ensures the quality of drinking water and is administered by the U.S. Environmental Protection Agency EPA. The EPA sets standards for drinking water quality and oversees the states, localities, and water suppliers who implement those standards. The Act authorizes the EPA to set national health-based standards for drinking water to protect against both naturally occurring and man-made contaminants that may be found in drinking water and cause harm to the public.

State Policies and Regulations

California Drinking Water Program (DWP)

The DWP regulates public water systems, oversees water recycling projects, permits water treatment devices, certifies drinking water treatment and distribution operators, and supports and promotes water system security.

Local Policies and Regulations

Stanislaus County General Plan

The Stanislaus County General Plan guides development for the County with a 20-year planning horizon.

The following policies in the Stanislaus County General Plan, Safety Element would apply to the project (Stanislaus County 1994):

> *Policy Seven* – Adequate fire and sheriff protection shall be provided.

City of Modesto

The City of Modesto Urban Area General Plan serves as a blueprint for future growth within the City. The Plan outlines policies that focus on a community vision (City of Modesto 2008). The following policy in the Urban Area General Plan relating to public services and utilities would apply to the project:

> *General Water Goal*: Ensure a consistent, reliable, high-quality water supply for the City of Modesto and its customers.
>
> *Water Policies- Baseline Developed Area (i)*: The City of Modesto should continue to pursue additional potential water supply alternatives available to the City to accommodate growth and meet future demand in both normal and dry years.
>
> *General Wastewater Goal*: The objective of the City's wastewater system is to meet increasingly strict wastewater regulations in a cost-effective manner. As demand for water increases in California, reclaiming wastewater could create opportunities to optimize the region's water

resources. Similar opportunities exist for the beneficial reuse of biosolids and digester gas, and other residuals of wastewater treatment.

Wastewater Policies- Baseline Developed Area (b): The City shall support the near-term expansion of the wastewater treatment and disposal capacity of the Jennings Road Secondary Treatment Plant.

Wastewater Policies- Baseline Developed Area (f): The City shall continue to support, develop, and research future water reclamation opportunities as a water resource.

Wastewater Policies- Baseline Developed Area (m): The City will encourage the regional beneficial reuse of reclaimed water. The City is committed to development of a full reclamation program in the long term. The City will comply with Title 22 standards for use of reclaimed water and criteria contained in the California Department of Public Health (CDPH) "Purple Book."

Fire Protection Policies- Baseline Developed Area and Planned Urbanizing Area (b): The City of Modesto shall ensure adequate ingress and egress to all structures for firefighting and rescue purposes independent of privately owned and maintained driveways.

Fire Protection Policies- Baseline Developed Area and Planned Urbanizing Area (k): The City of Modesto shall protect life and property by requiring engineered fire protection systems and fire resistive roof systems as part of all new construction; in situations where access is limited, fire sprinkler shall be required for new construction.

3.16.3 Impact Analysis/Environmental Consequences

Methodology for Analysis

Potential impacts on public services and utilities are analyzed based on the potential for the proposed project to affect the services described above in *Section 3.16.1 Environmental Setting/Affected Environment.*

Thresholds of Significance

Consistent with Appendix G of the *CEQA Guidelines* a public service or utility impact would be considered significant if the project would:

- Result in substantial adverse impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for fire protection, police protection, schools, parks, or other public facilities;
- Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board;
- Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects or result in the determination by the wastewater treatment provider which serves or may serve the project that it does not have adequate capacity to serve the project's projected demand in addition to the provider's existing commitments;
- Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- Have insufficient water supplies available to serve the project from existing entitlements and resources, and thus require new or expanded entitlements

- Result in a determination by the wastewater treatment provider which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments;
- Be served by a landfill without sufficient permitted capacity to accommodate the project's solid waste disposal needs or violate federal, state, and local statutes and regulations related to solid waste; or
- Comply with federal, state, and local statues and regulations related to solid waste.

Criteria Requiring No Further Evaluation

Criteria listed above that are not applicable to actions associated with the proposed project are identified below along with a supporting rationale as to why further consideration is unnecessary and a no-impact determination is appropriate.

- *Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects* — The proposed project itself entails construction of new facilities to augment water supply with recycled water. The environmental effects of the proposed facilities are evaluated throughout this document. The proposed project would not require or result in the construction of new water or wastewater treatment facilities beyond those being analyzed within this environmental document.
- *Require or results in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects* – The proposed project would not generate a substantial increase in the amount of stormwater runoff as virtually all proposed project elements would either buried underground or would be constructed on presently impervious land. The proposed project would thus not generate a need for new stormwater drainage facilities or the expansion of existing facilities.
- *Have insufficient water supplies available to serve the project from existing entitlements and resources, and thus require new or expanded entitlements – :* The proposed project itself is designed to provide a supplemental water supply to the study area, and would not create a new demand for water supply. The proposed project would not require any additional entitlements, beyond those that are included and evaluated throughout this document.
- *Result in a determination by the wastewater treatment provider which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments* – The proposed project is a water supply project, using recycled water a source of non-potable water for beneficial use. The proposed project would not generate any additional demand for wastewater treatment, beyond that proposed as part of the proposed project. Thus, no further evaluation is required.

Impacts and Mitigation Measures

Impact PUB-1 Impacts Associated with New or Altered Governmental Facilities to Maintain Acceptable Levels of Performance

Combined Alignment Alternative

The project includes a pipeline and pump station to convey recycled water to potential customers and does not include residential or commercial development that would directly induce population growth and require new or expanded fire and police protection, schools, parks, or other public facilities (see *Chapter 4*). In addition, implementation of the project would not indirectly induce unplanned population growth that would place new demands on local public service providers, as the resulting water would be provided to existing customers. Thus, the project would not result, directly or indirectly, in substantial adverse impacts associated with the provision of new or physically altered governmental facilities. The project

does not generate a need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts. The project is not expected to affect the ability of local providers to maintain acceptable service ratios, response times or other performance objectives for fire protection, police protection, schools, parks, or other public facilities. Similarly, the operation and maintenance of the proposed project would not substantially increase the need for new staff from the public service entities.

During construction, accidents could occur in the work area. These accidents would temporarily increase demand for emergency services, which would occur on an as-needed and emergency basis. This short-term increase could be accommodated by the service providers in the study area. Because the proposed project would not require additional public services, this impact is considered less than significant.

Separate Alignment Alternative

Impacts would be the same as the Combined Alignment Alternative.

PID Conveyance Alternative

Impacts would be the same as the Combined Alignment Alternative and Separate Alignment Alternative.

No Action Alternative

If no action were taken, there would be no public service impacts within the study area.

Significance Determination before Mitigation

Less than significant for all action alternatives.

Mitigation Measures

No mitigation measures are required.

Impact PUB-2 Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board (RWQCB).

Combined Alignment Alternative

Recycled water, blended with DMC water, would be delivered to farms within DPWD and the refuge's service area. Discharge of recycled water to the DMC would be subject to an NPDES Permit, which would be issued by the RWQCB. The project would be designed to meet all water quality requirements specified by the RWQCB. Refer to *Section 3.11, Hydrology and Water* Quality for additional discussion of water quality.

Separate Alignment Alternative

Impacts would be the same as the Combined Alignment Alternative.

PID Conveyance Alternative

Recycled water would be blended with San Joaquin River water and water in the DMC, before being delivered to farms within DPWD's service area. Discharge of recycled water to the San Joaquin River would continue to be subject to NPDES Permits held by the Cities of Turlock and Modesto, which have been issued by the Regional Water Quality Control Board (RWQCB). The project would have to meet all water quality requirements specified by the RWQCB for discharge, including both existing requirements and potential future requirements, which are becoming increasingly stringent. With continued discharge to the river it is expected that both treatment plants would have to be upgraded in the future to meet more stringent requirements for salt and nutrient removal. It is likely that both plants would have to provide partial treatment via reverse osmosis for salinity removal, which would then require brine disposal for the salts that are removed during treatment. The Modesto Jennings Plant currently provides removal of nitrates/nitrite, but the Turlock facility only removes ammonia. It is likely that Turlock would have to

upgrade their treatment process to include nitrogen removal and UV disinfection. The possibility that the existing Turlock and Modesto treatment plants would not meet future treatment requirements is considered a potentially significant impact.

No Action Alternative

If no action were taken, treated wastewater would continue to be discharged to the San Joaquin River, pursuant to existing NPDES permits for the Cities of Modesto and Turlock.

Significance Determination before Mitigation

Less than significant, Alternatives 1 and 2; potentially significant, Alternative 3.

Mitigation Measures

No mitigation measures are required for Alternatives 1 and 2.

Mitigation Measure PUB-2: Treatment Plant Upgrades (Alternative 3)

The Cities of Modesto and Turlock would upgrade treatment facilities as needed to meet future requirements for salinity and nutrient removal, plus other future treatment requirements established by the RWQCB.

Significance Determination after Mitigation

Less than significant.

Impact PUB-3 Served By a Landfill without Sufficient Permitted Capacity or Violate Regulations Related to Solid Waste

Combined Alignment Alternative

During construction of the proposed project, there would be minimal solid waste generated that would require disposal at a landfill. Spoil, including soil and rock, that would be excavated during construction of the project would either be reused on site for backfilling or disposed of properly. Spoil unable to be reused would be temporarily stored at staging areas until characterized, and then hauled away to the proper disposal site. Additional solid waste would be generated by construction crews within the study area, which would need to be hauled off site to be disposed.

Operation of buried pipelines and pump stations would not generate solid waste. All pipelines would be buried and the repurposed Jennings Plant Pump Station would not generate any additional solid waste that would require disposal at a landfill.

Solid waste generated during construction, including spoil that cannot be reused, would likely be delivered to the Fink Road Sanitary Landfill. This landfill is currently sized to satisfy all county landfill disposal needs through 2076 (Stanislaus County 2002). As such, impacts to landfill resources would be less than significant. The proposed project would comply with all federal, state, and local statues and regulations related to solid waste

Separate Alignment Alternative

Impacts for this Alternative would include all of those mentioned above, and impacts resulting from the construction of the new pump station near the western end of the Harding Drain Bypass Pipeline. These impacts would include additional spoil material and other trash and solid waste generated by crews during construction.

PID Conveyance Alternative

Impacts would be similar to those of the Combined and Separate Alignment Alternatives. These impacts would include generation of spoil material and other trash and solid waste generated by crews during construction.

No Action Alternative

If no action were taken, there would be no solid waste impacts within the study area.

Significance Determination before Mitigation

Less than significant for Alternatives 1, 2 and 3.

Mitigation Measures

No mitigation measures are required.

Impact PUB-4 Temporary Disruption of Utilities Due to Construction-Related Activities

Combined Alignment Alternative

The proposed project includes the construction of pipelines within and alongside roads, where other utilities are commonly found. Construction of the proposed project could potentially conflict with existing utilities located along the roadways and near the pump station, particularly underground utilities and/or overhead lines. If these utilities are not clearly identified prior to construction, damage and temporary disruption to those lines, and interruption of the associated services could result. Potential damage to major utility lines could result in significant impacts to the service area, unless appropriate coordination and notification of other service providers is conducted during project planning, design, and construction. Temporary disruption of utility services (i.e., electricity and water) is possible and must be mitigated to ensure that existing construction of the proposed project is not impacted. **Mitigation Measure PUB-4** would reduce this potential impact to less than significant.

Separate Alignment Alternative

Impacts would be the same as Combined Alignment Alternative.

PID Conveyance Alternative

Impacts would be the similar to the Combined and Separate Alignment Alternatives, though the potential for disruption of utilities in roadways would be slightly less because less pipeline construction in roadways would be needed. However, this alternative would require conveyance through PID facilities, and would require substantial expansion of those facilities. There is thus a possibility for interruption of water deliveries to PID customers during construction.

No Action Alternative

If no action were taken, there would be no utility or public service impacts within the study area.

Significance Determination before Mitigation

Potentially significant for all action alternatives.

Mitigation Measures

Mitigation Measure PUB-4: Coordinate Relocation and Interruptions of Service with Utility Providers during Construction (Alternatives 1, 2 and 3)

The construction contractor shall be required to verify the nature and location of underground utilities before the start of any construction that would require excavation. The contractor shall be required to notify and coordinate with public and private utility providers at least 48 hours before the commencement of work adjacent to any utility. The contractor shall be required to notify the service provider in advance of service interruptions to allow the service provider sufficient time to notify customers. The contractor shall be required to coordinate timing of interruptions with the service providers to minimize the frequency and duration of interruptions.

Significance Determination after Mitigation

Less than significant.

Impact PUB-5 Could Require Construction of New Wastewater Treatment Facilities that Would Cause Significant Environmental Effects

Combined Alignment and Separate Alignment Alternatives

These alternatives include construction of new facilities to augment water supply with recycled water. The environmental effects of the proposed facilities are evaluated throughout this document. These alternatives would not require or result in the construction of new water or wastewater treatment facilities beyond those being analyzed within this environmental document. There would be no impact.

PID Conveyance Alternative

As noted above, **Mitigation Measure PUB-2** could require future treatment plant upgrades if the RWQCB imposes additional requirements for removal of salinity and nutrients. It is likely that treatment facilities could be constructed within the existing treatment plant sites, so it is projected that siting of facilities would not result in significant impacts to sensitive cultural or biological resources or to residents in the project area. However, if reverse osmosis treatment is needed to remove salinity, the treatment process would produce brine (highly saline water containing the salts that are removed by the reverse osmosis process). Brine disposal in an inland area is typically difficult because ocean disposal options are not available. Given the uncertainties regarding brine disposal, it is possible that brine disposal could require construction of facilities that would have a significant impact on the environment.

No Action Alternative

Similar to the PID Conveyance Alternative, with continued discharge to the river, it may be necessary for the Cities of Modesto and Turlock to construct treatment plant upgrades if discharge to the river continues. Construction of new facilities, including brine disposal, could have a significant impact on the environment.

Significance Determination before Mitigation

No impact, Combined Alignment and Separate Alignment Alternatives; significant and potentially unavoidable for PID Conveyance Alternative and No Action Alternative.

Mitigation Measures

Although mitigation of impacts may be possible, due to the high level of uncertainty regarding brine disposal it is not possible to define specific mitigation and this impact is considered to be potentially significant and unavoidable.

Significance Determination after Mitigation

No impact, Combined Alignment and Separate Alignment Alternatives; potentially significant and unavoidable for PID Conveyance Alternative and No Action Alternative.

Cumulative Impacts

The geographic scope of potential cumulative impacts related to public services and utilities includes the study area, Stanislaus County, and the service areas of each of the agencies listed in Section 13.16.1 above. There are three relevant projects within the vicinity of the proposed project that may contribute to cumulative impacts:

- Jennings Treatment Plant Phase 2 Upgrades: increase tertiary treatment capacity by 12.6 MGD;
- West Main Improvement Project: widen West Main Ave to 3 lanes from the San Joaquin River to Crows Landing Road (Stanislaus County Department of Public Works 2011);

- StanCOG South Corridor Study: study potential alignments and corridor options for an expressway from the City of Turlock on the east to I-5 on the west (Stanislaus County Department of Public Works 2011).

Cumulative projects could result in increases in the generation of solid waste, damage to utilities, and disruption to utility service. Because the proposed project is not expected to generate substantial amounts of solid waste and there is sufficient capacity at the landfill through 2076, the proposed project would not contribute to cumulatively considerable impacts. With respect to utility impacts during construction, the implementation of **Mitigation Measure PUB-4** would reduce the proposed project's contribution to cumulative effects. As such, it would not contribute to cumulatively considerable impacts.

The PID Conveyance Alternative and No Action Alternative may require future treatment plant upgrades, which could result in cumulatively considerable impacts. Also, if discharge standards for salts and nutrients become more stringent, it's likely that other dischargers to the San Joaquin River would also have to upgrade treatment facilities. Timing of the upgrades is uncertain, and would not likely overlap with construction of the Jennings Treatment Plant Phase 2 Upgrades, which should be completed in 2016. However, due to the uncertainties regarding brine disposal, there is a possibility of cumulatively significant impacts.

3.16.4 References

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3.17 Recreation

This section evaluates the potential adverse impacts related to recreational uses that could result from implementation of the proposed project. Recreational resources (e.g., parks, bikeways, fishing access, etc.) within the project area are described, along with related County General Plan polices. The impact analysis presents the standards used to evaluate impacts to recreational resources and addresses potential effects of the proposed project on such resources. Also assessed are the potential effects that could result from an increase in water flows to the south-of- Delta CVPIA-designated Refuges.

3.17.1 Environmental Setting/Affected Environment

The following sections describe the environmental setting for recreational uses and facilities in the project site vicinity.

Project Site Vicinity

The proposed project area is generally located in the central portion of Stanislaus County and includes areas that are north, west, and south of the City of Patterson. Area residents have access to recreational opportunities and facilities including several park and fishing areas, bikeways, and recreational centers. The park system that exists today reflects the historical growth patterns of the project area and the trends for certain types of recreational facilities that have been popular as the local park system has developed.

The two action alternatives would require one or more crossing of the San Joaquin River, SR 33, the California Northern Railroad Company railroad tracks, and irrigation canals. Land uses adjacent to the alignments and other new/constructed facilities consist of agriculture and rural residences. Further discussion of recreational opportunities in the vicinity of the alternatives follows.

Jennings Plant Pump Station

The City of Modesto Wastewater Division maintains a secondary treatment and tertiary facility on Jennings Road northeast of the City of Patterson. The effluent ponds of the Jennings Plant Pump Station form the largest wetland in Stanislaus County and attract a large number of migratory birds. Public access to the area is restricted; the Stanislaus Audubon Society organizes bird watching tours at the facility (City of Modesto 2014; Stanislaus Audubon Society 2014).

Local Bikeways

A review of available maps indicates that no designated bikeways traverse the project area. For further discussion of bikeways, please see Section 3.18, *Transportation and Traffic.*

Fishing Access

In the project vicinity, there is one access point for fishing in the San Joaquin River. Las Palmas Fishing Access is located adjacent to the existing PID intake on the San Joaquin River east of Patterson off of route J17 (Las Palmas/West Main Street). The three-acre park has one mile of river frontage with a parking lot, restrooms, concrete boat ramp, barbecues, picnic tables and handicapped access.

South of the Delta CPVIA-designated Wildlife Areas

As discussed in *Chapter 2, Project Description*, in addition to providing water to the DPWD service area, the proposed project would make recycled water available to South of the Delta refuges. Multiple Federal National Wildlife Areas (NWAs) and state wildlife areas (WAs), and one privately-managed complex in the Central Valley are designated as CVPIA units/refuges. These areas are generally open spaces containing habitat such as wetlands, native grasslands, riparian forests, and vernal pools that support a variety of fish and wildlife species and are an important part of the Pacific Flyway, a major migration route for migratory birds. Most of them are open to the public. They provide opportunities for

birdwatching, wildlife viewing, hiking, biking, boating, and fishing. **Table 3.17-1** lists the CPVIA units/refuges located south of the Delta that could potentially be served by the proposed project.

Table 3.17-1: South-of-the-Delta CVPIA Wildlife Areas

Facility Name	Location	Activities Available	Acres (approx.)
San Luis NWR (USFWS)[1] • East Bear Creek Unit • Freitas Unit • Kesterson Unit • San Luis Unit • West Bear Creek Unit	Merced County: Approximately 10 miles north of Los Banos	Exhibit hall with interactive educational exhibits, auto/trail routes, bird watching, waterfowl hunting, fishing, and Tule Elk viewing	26,800
Kern NWR (USFWS)[1]	Kern County: 20 miles west of the City of Delano	Auto route, waterfowl hunting, fishing, wildlife viewing	11,249
Volta WA(CDFW)[2]	Merced County: 0.75 mile north of Volta	Waterfowl hunting, nature trails, wildlife viewing	2,891
Mendota WA (CDFW)[2]	Fresno County: 3 miles south of Mendota near Whites Bridge	Camping during waterfowl season, hunting, fishing, wildlife viewing.	11,802
Los Banos WA (CDFW)[2]	Merced County: 4 miles northeast of Los Banos on Henry Miller Avenue	Hunting, hiking, biking, bird watching, boat launch, fishing, kayaking, walking and bicycling on undesignated trails	6,217
North Grasslands WA (CDFW)[2] • Salt Slough Unit • China Island Unit	Merced and Stanislaus Counties: Generally 6 miles north of Los Banos	Camping during waterfowl season, hunting, boat launch, fishing, boating, wildlife viewing.	7,069
Grasslands Wildlife Management Area (USFWS) [1;3]	Merced County: Santa Fe Grade Rd, several miles east of Los Banos, CA	Closed to public use; wildlife viewing is accessible from adjacent roads, primarily Sante Fe Grade Road, which bisects the north and south Grasslands in a NW/SE direction, north and south of Los Banos	60,000

Sources:
1. USFWS
2. CDFW 2014
3. Recreation.gov 2014

San Luis Reservoir State Recreation Area (SRA)

Nestled in the grassy hills of the western San Joaquin Valley near historic Pacheco Pass, San Luis Reservoir State Recreation Area is noted for boating, board sailing, fishing, camping, and picnicking. San Luis Reservoir was constructed as a storage reservoir for the federal CVP and the California State Water Project. It stores runoff water from the Delta that would otherwise flow into the ocean. The water arrives through the California Aqueduct and the Delta-Mendota Canal, and is pumped from the O'Neill Forebay into the main reservoir whenever system demands are below the export capacity of the combined

pumping plants. As described in *Chapter 2, Project Description*, recycled water conveyed into the DMC as part of the proposed project during low-demand periods could be stored in the south of Delta CVP system, including San Luis Reservoir.

A visitor center at the Romero Overlook provides full information on the reservoir and other water projects through audio-visual and printed materials. Telescopes are also available for viewing the area. The Romero Visitor Center is administered by the California Department of Water Resources.

San Luis Reservoir State Recreation Area has four campgrounds: Basalt, San Luis Creek, Medeiros, and Los Banos Creek. All campgrounds are open year round. North and South Beach day-use areas have about 200 picnic sites with shade ramadas, tables, and BBQ grills. Both day-use areas have plenty of shade and grass. North Beach is the only designated swim area within San Luis Reservoir State Recreation Area. San Luis Reservoir State Recreation Area consists of three water bodies: San Luis Reservoir, O'Neill Forebay, and Los Banos Creek Reservoir, all of which are accessible to boaters, although Los Banos Creek is subject to winter closure because of water release from the reservoir (State Parks 2014).

3.17.2 Regulatory Framework

This section describes laws and regulations at the federal, state, and local level that may apply to the proposed project.

Federal Policies and Regulations

Public Law 102-575, Title 34, Central Valley Project Improvement Act (CVPIA)

See *Section 3.4.2, Biological Resources, Regulatory Framework.*

Public Law 105-57, National Wildlife Refuge System Improvement Act of 1997

See *Section 3.4.2, Biological Resources, Regulatory Framework.*

San Joaquin River National Wildlife Refuge Comprehensive Conservation Plan

The San Joaquin River NWR is 9 miles west of the city of Modesto and straddles western Stanislaus and Southern San Joaquin Counties. This NWR was established in 1987 primarily to protect wintering habitat for Aleutian Canadian goose (*Branta canadensis leucopareia*), then a federally-listed endangered species. The refuge also serves to protect other threatened and endangered species that depend on wetlands and riparian floodplain habitat. The refuge played a pivotal role in the removal of the Aleutian Canada goose from the federal Threatened and Endangered Species List in 2001.

The San Joaquin River NWR Comprehensive Conservation Plan (CCP) (USFWS 2006) was developed to guide the management of the San Joaquin River NWR for the next 15 years. The San Joaquin River NWR provides protection for both wetland- and upland-dependent wildlife species of California's Central Valley. The goals of the San Joaquin River NWR CCP include providing opportunities for environmental education about native California habitats and wildlife and their conservation and restoration, providing the public with wildlife viewing and photographic opportunities, and providing other recreational activities such as waterfowl hunting and fishing.

State Policies and Regulations

Public Trust Doctrine

The Public Trust Doctrine espouses the notion that title to lands under navigable waters up to the high water mark is held by the state in trust for the people (California State Lands Commission n.d.). The Submerged Lands Act grants states sovereignty over their tide and submerged lands, and the Supreme

Court established the states' duty to protect (in perpetuity) the public's interest in these areas.[1] The California Supreme Court has interpreted the range of public interest values in these waterways to include general recreation activities such as swimming and boating, as well as preservation of lands in their natural state as open space, as wildlife habitat, and for scientific study.[2,3] The Public Trust Doctrine applies to the San Joaquin River in the vicinity of the proposed project.

Local Policies and Regulations

Stanislaus County General Plan

Stanislaus County has identified the following goals and policies in the Conservation Element of the General Plan (1994) that are relevant to the proposed project:

GOAL 1: Encourage the protection and preservation of natural and scenic areas throughout the County.

Policy 1: Maintain the natural environment in areas dedicated as parks and open spaces.

Policy 2: Assure compatibility between natural areas and development.

GOAL 4: Provide for the open-space recreational needs of the residents of the County.

Policy 14: Provide for diverse recreational opportunities such as horseback riding trails, hiking trails, and bikeways.

Policy 15: Coordinate the provision of recreation needs with the other providers such as the ACOE [Army Corps of Engineers], the State Resources Agency, school districts, river rafters, horse stable operators, and private organizations such as the Sierra Club and Audubon Society.

Stanislaus County Parks Master Plan

The Stanislaus County Parks Master Plan (1998) provides a comprehensive overview to guide the Board of Supervisors, Parks Recreation Commission and the Parks Department in meeting a variety of goals for park lands and users over the next twenty years. In 1994, Stanislaus County updated its General Plan and charged the Parks Department and Parks Commission with accomplishing the development of a Parks Master Plan. Development of this long range plan has included a needs assessment, specific park plans, future planning, development of design standards, and economic and fiscal planning.

The Stanislaus County Parks Master Plan prioritizes simple inexpensive activities, outdoor activities involving the natural environment, and park amenities that include bathroom facilities, children's play areas, barbeques, lighted areas, bike paths, and sports fields. The plan recognizes the importance of fishing access along the county's waterways.

Merced County General Plan

Merced County contains approximately 114,000 acres of county, state, and federal parks and recreation areas and public open space areas. Merced County is in the process of updating its General Plan. The 2030 Merced County General Plan Planning Commission Review Draft (Merced County 2011) Recreation and Cultural Resources Element recognizes that recreational resources provide economic, health, and open space benefits. The majority of the NWRs and WAs that could receive water flows from

[1] *Illinois Central Railroad v. Illinois,* 1892. 146 U.S. 387. The Public Trust Doctrine has yet to be applied to federal lands and waters through statutes or case law.
[2] Marks v. Whitney. 1971. 6 Cal.3d 251; National Audubon Society v. Superior Court. 1983. 33 Cal.3d 419; People v. California Fish Co. 1913. 166 Cal. 576.
[3] Frank, R. M. 1983. "Forever Free: Navigability, Inland Waterways, and the Expanding Public Interest." *University of California, Davis Law Review:*16:579. California case law also establishes a link between navigation and recreation, and verges on treating the two as interchangeable public interests.

the proposed project are located in Merced County. The following goals and policies in the Recreation and Cultural Resources Element are relevant to the proposed project:

GOAL RCR-1: Preserve, enhance, expand, and manage Merced County's diverse system of regional parks, trails, recreation areas, and natural resources for the enjoyment of present and future residents and park visitors.

> Policy RCR-1.1: Encourage the continuation and expansion of existing public recreation land uses, including, but not limited to, public beaches, parks, recreation areas, wildlife areas, and trails.

San Joaquin CountyGeneral Plan

The Public Facilities chapter of the San Joaquin County General Plan (2010) describes the health, economic, and natural resource benefits of recreation and the necessity of providing recreational opportunities for all of the County's residents. Water-based activities such as fishing, boating, swimming, and water skiing, are the most popular recreational activities in San Joaquin County. There are about 400 miles of waterways in the County, including the California Delta, Mokelumne River, Stanislaus River, Calaveras River, and several canals, aqueducts, and borrow sites. The DMC passes through the County, however there are no legal recreational access points on the canal within San Joaquin County (San Joaquin County 2010).

City of Modesto

One of the goals of the City of Modesto's Urban General Plan is to preserve the natural river corridors in Modesto for recreational and open space opportunities. However, the Urban General Plan does not include any specific policies relevant to recreational resources in the project area (City of Modesto 2008).

3.17.3 Impact Analysis/Environmental Consequences

Methodology for Analysis

This section evaluates whether construction and operation of the facilities associated with the proposed project would result in significant impacts related to recreational resources. The analysis is based on the project's preliminary design information, including construction methods and procedures, and project design and management, when weighed against the baseline environmental conditions of recreational facilities the project area.

The evaluation addresses direct effects on recreational facilities, as well as indirect effects, such as changes in recreational opportunities that could affect the use of the related recreational facility or another facility elsewhere. For example, the evaluation considers whether a reduction in recreational opportunities at a given location could displace users to a different location, resulting in an increase in use and potential for deterioration of the facilities at that other location.

Project water that may be stored at San Luis Reservoir or other CVP facilities that have recreational facilities would not be anticipated to be measurably affected by the project (e.g., no measurable change in water levels) and so impacts in these locations are not considered further.

Thresholds of Significance

Consistent with Appendix G of the *CEQA Guidelines* an impact on recreational resources would be considered significant if the project would:

- Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial deterioration of the facility would occur or be accelerated.
- Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.

Criteria Requiring No Further Evaluation

Criteria listed above that are not applicable to actions associated with the proposed project are identified below along with a supporting rationale as to why further consideration is unnecessary and a no-impact determination is appropriate.

- *Inclusion of Recreational Facilities or Require Construction or Expansion of Recreational Facilities* – The proposed project does not include recreational facilities nor would it include construction or expansion of recreational facilities. Therefore, there would be no impacts on the environment related to construction of new or expanded recreational facilities.

Impacts and Mitigation Measures

Impact REC-1 Substantial Impairment of the Use of Existing Parks or Other Recreational Facilities

Combined Alignment Alternative

Land uses adjacent to the Combined Pipeline Alternative consist of agriculture and rural residences. Pump station construction and operation would occur at the existing Jennings Plant. Public access to the Jennings Plant is restricted, although tours are granted to bird watching groups (see *Section 3.17.1, Environmental Setting/Affected Environment*, above, for more information). The proposed project would not change the amount of water available for storage in the effluent ponds. A 54-inch-diameter pipe would deliver to the DMC near Zacharias Road. However, because fishing access at the DMC is no longer available, access to the canal would not be impacted, so this impact is considered less than significant. Once constructed, the discharge site would not interfere with access to the DMC. No other public recreational facilities are located within or adjacent to the project alignment; therefore, there would be no potential for impact to existing parks or other recreational facilities.

Separate Alignment Alternative

Land uses adjacent to the Separate Pipeline Alternative are similar to those of the Combined Pipeline Alternative. The existing pump station at Jennings Plant would be modified and a new pump station would be constructed at the Harding Drain Bypass Pipeline, located near South Carpenter Road. Currently, the latter site is vacant and consists of open space and agricultural land uses. Under Alternative 2, one 42-inch-diameter pipeline would introduce supply to the DMC at the terminus of Zacharias Road, and another 42-inch-diameter pipe would discharge north of West Marshall Road. Once constructed neither introduction point would interfere with access to the DMC. No other public recreational facilities are located within or adjacent to the project alignment; therefore there would be no impact to existing parks or other recreational facilities from Alternative 2.

PID Conveyance Alternative

Land uses adjacent to pipeline alignment are similar to those along the Separate Pipeline Alternative and Combined Pipeline Alternative, and pipeline construction would not be expected to impair recreational uses. The existing PID intake facility is immediately south of an existing recreation area and boat ramp on the San Joaquin River. Construction at the intake site would not be expected to affect the boat ramp facility (PID 2006). As with Alternatives 1 and 2, a discharge structure would need to be constructed at the DMC. Once constructed, the discharge site would not interfere with access to the DMC. No other public recreational facilities are located within or adjacent to the project alignment; therefore there would be no impact to existing parks or other recreational facilities from Alternative 3.

No Action Alternative

Under the No Action Alternative, no new pipeline or pump station construction and operation would occur. Therefore, no impacts on recreational facilities would occur.

Significance Determination

Less than Significant for all action alternatives.

Mitigation Measures

None.

Impact REC-2 Increase in Water Flow to the National Wildlife Refuges Such that Substantial Increase in Birdwatching and Other Recreational Opportunities Would Occur

Combined Alignment Alternative

The proposed project would make recycled water available to the south of the Delta Central Valley Project Improvement Act (CVPIA)-designated Refuges to meet CVPIA requirements (see *Chapter 2, Project Description* for more detail). These refuges contain habitat that supports a variety of fish and wildlife species, and are an important part of the Pacific Flyway, a major migration route for migratory birds. An increase in water supply would most likely lead to an increase in habitat for these species. While this conceivably could have a beneficial effect on recreational viewing opportunities at the refuges that receive water from the proposed project, causing an increase in recreational use, no determination has yet been made which of the Refuges would be served by the proposed project. Furthermore, it is considered very unlikely that the project could lead to such a substantial increase in recreational use at any given location that substantial deterioration of facilities would result, thus there would be no impact.

Separate Alignment Alternative

See Alternative 1. There would be no impact.

PID Conveyance Alternative

Impacts would be the same as the Combined and Separate Alignment Alternatives. There would be no impact.

No Action Alternative

Under the No Project Alternative, there would be no change to the water supply to south-of-Delta CVPIA-designated Refuges, and as such no change in recreational opportunities or use of recreational facilities at these locations. There would be no impact.

Significance Determination

No Impact for all action alternatives.

Mitigation Measures

None.

Cumulative Impact Analysis

The proposed project would have no impact on recreation, and so would have no potential to contribute to any cumulative impacts related to recreation. There would be no impact.

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3.18 Socioeconomics

This section describes the socioeconomic conditions in the study area, and discusses the effect on the economy that could be expected to result from implementing the Project. Evaluation of socioeconomic impacts is required for NEPA, but not for CEQA. Section 15131 (a) of the CEQA Guidelines notes that "Economic and social effects of a project shall not be treated as significant effects on the environment." This section thus does not apply CEQA significance thresholds to the evaluation of socioeconomic effects, and no determinations of significance are made.

3.18.1 Environmental Setting/Affected Environment

The following sections present socioeconomic data for San Joaquin, Stanislaus and Merced Counties. Data was obtained from the U.S. Census, and the most current available data are for 2013.

Population and Employment

Table 3.18-1 shows the estimated population in San Joaquin, Stanislaus and Merced Counties and the numbers of individuals employed in various industries in each county.

Table 3.18-1: Population and Employment by Industry Sector - 2013

Category	San Joaquin County	Stanislaus County	Merced County
Total Population	685,306	514,453	255,793
Employed Population	269,943	202,047	96,057
INDUSTRY			
Agriculture, forestry, fishing, hunting, mining	13,782	11,124	13,576
Construction	18,092	12,162	6,567
Wholesale trade	26,382	26,592	12,064
Retail trade	9,879	7,084	2,804
Transportation, warehousing, utilities	36,930	28,422	10,097
Information	15,945	9,012	4,854
Finance, insurance and real estate	5,729	1,540	1,614
Professional, scientific, management, administrative, waste management services	12,298	8,856	3,767
Education, health care	27,759	19,374	5,978
Arts, entertainment, recreation, accommodation, food services	58,147	43,340	21,272
Other services (not public)	20,462	15,688	5,440
Public administration	12,770	10,804	4,245
Median income (dollars)	$56,652	$50,686	$49,870
Per capita income (dollars)	$21,652	$20,608	$17,838

Source: U.S. Census 2013

After rising steadily through 2011, overall unemployment rates in the three counties served by DPWD have decreased in the last several years. **Table 3.18-2** shows unemployment rates in San Joaquin,

Stanislaus and Merced Counties from 2008 through mid-2014. Information for June 2014 is preliminary monthly unemployment data.

Table 3.18-2: Annual Average Unemployment Rates

Year	San Joaquin County	Stanislaus County	Merced County
2008	10.4	11.0	12.5
2009	15.3	15.8	16.9
2010	17.3	17.2	18.7
2011	16.8	16.7	18.2
2012	15.0	15.1	16.9
2013	12.8	13.0	14.7
June 2014 (preliminary)	10.5	11.1	12.3

Source: California EDD 2014

Agricultural Water Use and Production

DPWD is under contract with Reclamation for delivery of up to 140,210 AF of CVP water annually to approximately 45,000 acres of highly productive farmland with a production value of over $130 million gross farm dollars annually (RMC 2013). Prior to the implementation of the CVPIA, and the advent of other legal and regulatory delivery constraints, DPWD typically received its full water allocation every year. When the full water allocation was available, normal agricultural fallowing in the DPWD service area averaged 3,349 acres per year (RMC 2013).

As shown in **Table 3.18-3**, in only three water years out of the last twenty four was Reclamation able to provide full entitlement deliveries of CVP water to DPWD. On-going shortages and lack of water supply reliability have created a severe hardship on DPWD and its growers. Preliminary 2014 reports indicate that fallowed acreage has increased by almost 4,000 acres over the prior year's total of 7,239 acres, resulting in a significant loss of both farm income and agricultural related jobs. The effect of these shortages on the agriculturally-based economies of the communities on the west side of the San Joaquin Valley has had severe economic repercussions and will exhibit continuing negative economic impacts as these losses ripple through the local and regional economies.

Uncertainties regarding water supply have ongoing effects on the local economy. Over the years from 2001 to 2013 growers in the DPWD service area increased acreage planted to higher value permanent crops, such as almonds, but in the face of uncertain water deliveries, growers may defer land conversion investments and leave lands fallow. However, this is not an option for lands already planted in permanent crops. Drought conditions and pumping restrictions have thus had major economic impacts on San Joaquin Valley counties (Michael and Hewitt et al. 2010).

Table 3.18-3: Historic Annual CVP Allocation

Year	Allocation (AFY)	Percent of Full Allocation
1990-91	70,105	50%
1991-92	35,053	25%
1992-93	35,053	25%
1993-94	70,105	50%
1994-95	58,888	42%
1995-96	140,210	100%
1997-98	126,189	90%
1998-99	140,210	100%
1999-2000	98,147	70%
2000-01	91,137	65%
2001-02	63,095	45%
2002-03	98,147	70%
2003-04	105,158	75%
2004-05	98,147	70%
2005-06	119,179	85%
2006-07	140,210	100%
2007-08	70,105	50%
2008-09	56,084	40%
2009-10	14,021	10%
2010-11	63,095	45%
2011-12	112,168	80%
2012-13	56,084	40%
2013-14	28,042	20%
2014-15	0	0%

3.18.2 Regulatory Framework

There are no federal or state regulations regarding socioeconomics that would apply to the project. This section describes laws and regulations at the local level that may apply to the project.

Local Policies and Regulations

Stanislaus County General Plan

The following goal is relevant to socioeconomics.

- Agriculture Goal One: Strengthen the agricultural sector of our economy.

San Joaquin County General Plan

The following objective is relevant to socioeconomics.

- Water Resources Objective 1: To ensure adequate quantity and quality of water resources for municipal and industrial uses, agriculture, recreation, and fish and wildlife.

Merced County General Plan

The following goal is relevant to socioeconomics.

> **GOAL AG-1:** Maintain the financial viability of the agricultural sector by encouraging expansion of commercial agriculture, attracting new agricultural support and value added industries, and promoting locally-grown commodity.

3.18.3 Impact Analysis/Environmental Consequences

The Council of Environmental Quality NEPA regulations (40 CFR 1508.8[b]) list economic and social factors among the effects that should be analyzed in preparing an EIS. Specifically economic and social effects should be discussed when they are interrelated with natural or physical effects (40 CFR 1508.14). However, NEPA does not require a determination of significance for economic impacts.

As noted in the introduction to this section, Section 15131 (a) of the CEQA Guidelines notes that "Economic and social effects of a project shall not be treated as significant effects on the environment." This section discusses economic effects and compares the No Action Alternative to the action alternatives, but significance determinations are not provided and thus no significance thresholds are presented, and no mitigation is proposed.

Methodology for Analysis

Potential economic benefits of the project/action were analyzed using a regional input-output model that was calibrated to existing local economic data. IMPLAN Version 3 software was used to derive the model. The analysis was focused on quantifying the income and employment benefits associated with additional water supply and did not take into account the short-term benefits of construction employment or ongoing operations and maintenance of the water conveyance facilities. Analysis was based on the potential agricultural cropping impacts from new recycled water supplies as direct, indirect and induced income and employment (Michael and Pogue 2010).

Impacts

Economic Benefits of Project/Action Alternatives

Combined Alignment and Separate Alignment Alternatives

In terms of potential economic benefits both alternatives would have the same effect. Effects are categorized as direct, indirect and induced. Direct effects are changes in expenditures and jobs related exclusively to cultivation that could be restored as a result of the NVRRWP. Indirect effects are the iterative impacts of inter-industry transactions as supplying industries respond to demands from cultivation. Induced effects reflect household consumption expenditures of direct and indirect sector employees.

Based on the analysis conducted by Michael and Pogue (2010), at buildout the project could result in 572 additional jobs, with $29,030,055 in total income and $67,537,627[1] in total output each year.

PID Conveyance Alternative

If the same amount of water can be delivered to DPWD the socioeconomic benefits of this alternative would be the same as for the Combined and Separate Alignment Alternatives. There might be some short-term disruption of service to growers served by the PID Main Canal during construction of the portions of the pipeline that cross existing laterals. This could have a minor economic impact, but due to the short-term nature of the disruption the effects would be expected to be fairly small.

[1] Income and output were calculated in 2010 dollars. Values in 2014 dollars, accounting for inflation using the Consumer Price Index, would be $31,665,665 in total income and $73,669,302 in total output each year.

No Action Alternative

The No Action Alternative would not result in any of the potential economic benefits of the project, and the agricultural economy in the DPWD service area would continue to be subject to the uncertainties of water supply. Additional years in which DPWD does not receive a full allocation of CVP water would result in ongoing adverse effects on the agricultural economy.

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3.19 Transportation and Traffic

This section evaluates the potential adverse impacts related to transportation and traffic that could result from implementation of the proposed project. The analysis is based on a review of traffic facilities in the project vicinity and local transportation plans.

3.19.1 Environmental Setting/Affected Environment

The following sections describe the environmental setting for transportation and traffic within the study area.

Regional Setting and Project Vicinity

The proposed project area is generally located in the central portion of Stanislaus County and includes areas that are north, east, and south of the City of Patterson. The Combined Alignment Alternative (Alternative 1) includes installation of a recycled water pipeline that would run approximately 69,800 feet beginning at Turlock's Harding Drain Bypass Pipeline, continuing north along South Carpenter Road, west on West Main Street, north on Jennings Road to Modesto's Jennings Plant, and then continues west beneath the San Joaquin River, and then along Lemon Avenue and Zacharias Road to the DMC. **Figure 2-2** shows the planned pipeline route for Alternative 1 and names of the affected roads.

The Separate Alignment Alternative (Alternative 2) includes independent pipeline segments from Turlock and Modesto's treatment facilities to the DMC. The northern segment of the pipeline follows the same route as the pipeline planned for Alternative 1 from the Jennings Plant outfall pump station to the DMC, beginning at Modesto's Jennings Plant and continuing west beneath the San Joaquin River, and then along Lemon Avenue and Zacharias Road to the DMC. The southern segment would begin from a new pump station located adjacent to the Harding Drain Bypass Pipeline, continue west underneath the San Joaquin River, across open space and along Pomegranate Avenue and a private road between Locust Avenue and SR 33, continue along West Marshall Road, jog around a substation to the north of West Marshall Road, and end at the DMC. **Figure 2-3** shows the planned pipeline route for Alternative 2 and names of the affected roads.

Regional Transportation Network

Stanislaus County is served by several major highways including Interstate 5, Highway 99, Highways 132 and 165, and County Road J17 (West Main Street). SR 33 is a two-lane and four-lane (within city limits only), north-south route that runs parallel to I-5 between Santa Nella and Vernalis. SR 108 has an east-west alignment from Riverbank and SR 219 to the county line. Within the county, SR 108 connects to SR 120. SR 120 is a major east-west, two- and four-lane state highway in northern Stanislaus County that is the continuation of the primary route to Yosemite National Park. SR 120 also connects Oakdale to San Joaquin County.

SR 132 travels throughout the county in an east-west two-lane configuration, through the center of Modesto. This highway is known as Maze Boulevard west of SR 99 and as Yosemite Boulevard east of SR 99. SR 165 is a north-south facility located in the southern portion of the county, between the Merced County line and SR 99 in Turlock. SR 219 is a two- and four- lane, east-west highway that connects with SR 99 near Salida and SR 108 in Modesto.

The proposed project would be located along several stretches of roadway that have been identified by the Stanislaus Council of Governments (StanCOG) as possible future expressways in the 2010 StanCOG Regional Expressway Study (StanCOG 2010). The following possible alignments are located within the proposed project area (StanCOG 2014a and StanCOG 2014c):

1. County Road J17 (West Main Street) may serve as the main artery of the planned South County Corridor, which is a planned multilane lane expressway that will connect the cities of Patterson

and Turlock. Construction required to widen West Main Street will occur in phases along segments of West Main Street; construction to widen West Main Street to three lanes from the San Joaquin River west to Carpenter Road is scheduled to begin in 2020 (StanCOG 2014b).

2. As part of the planned South County Corridor expressway, a Patterson Bypass is a planned expressway with an unspecified number of lanes that will route drivers around the City of Patterson and will serve to link Interstate 5 with the City of Turlock. The Patterson Bypass may use existing Zacharias Road and construction would involve widening the road and realigning the intersection of Zacharias Road and SR 33, but according to the City of Patterson 2010 General Plan EIR, the Patterson Bypass does not have any funding forecasted, although the City has identified it as a need (City of Patterson 2010) and is still under study (StanCOG 2010). Additionally, the intersection at Carpenter Road and West Main Street will be improved (StanCOG 2014a)
3. SR 33 is planned to be an expressway outside of the City of Patterson. It is currently a two lane road but StanCOG 2010 states there are plans to widen it to a four-lane expressway (StanCOG 2010). The City of Patterson General Plan EIR also states that SR 33 will be widened from downtown Patterson to the San Joaquin County line (but does not specify the number of lanes), and recommends widening the road to four lanes from the intersection of SR 33 and Sperry Road in downtown Patterson north to the intersection of Rogers Road and SR 33 (City of Patterson 2010).

Designated Truck Routes

Highways 132, 108, and 120 are the east-west arteries running through the County. The primary north-south arteries are SR 99 and Interstate 5. All county roads, unless otherwise signed, are designated truck routes.

Transit Service

Stanislaus Regional Transit (STaRT) offers transportation between cities within Stanislaus County and to the City of Merced via seven bus routes. Route 10 provides service between Modesto and Turlock during weekdays, and operates seventeen round trips between 5:05 a.m. and 10:35 p.m. Route 15 also provides service between Modesto and Turlock during weekdays, and combines with the Modesto/Riverbank/Oakdale route to provide Saturday service. Route 40 offers service to Modesto, Grayson, Westley, and Patterson, Monday through Saturday. Route 45 West offers service to Patterson, Crows Landing, Newman, and Gustine, Monday through Saturday, and Route 45 East offers Monday through Saturday service between Turlock and Patterson. Route 60 offers weekday service between Modesto and Oakdale, as well as Saturday service to Riverbank. Route 70 offers service to Modesto, Turlock, and Merced Monday through Saturday. STaRT offers curb-to-curb shuttle services between Modesto/Oakdale/Riverbank, Turlock/Modesto/Ceres/Keyes, and Waterford/Modesto/Hughson/Empire. STaRT also offers Dial-A-Ride services in Newman, Oakdale, Patterson, Riverbank, and Waterford. (STaRT 2014)

Turlock Transit Lines, operated by the City of Turlock, provides public transportation services via both the Bus Line Service of Turlock (BLAST) and Dial-A-Ride of Turlock (DART). BLAST service operates Monday through Friday, from 6:40 a.m. through 5:30 p.m. and from 9:25 a.m. through 4:00 p.m. on Saturday. BLAST serves virtually all major focal points in Turlock and Denair. DART provides curb-to-curb service to senior and disabled passengers in the greater Turlock and Denair areas. In Turlock, DART service is offered Monday through Friday, from 6:40 a.m. to 5:30 p.m., and on Saturday, from 9:25 a.m. to 4:00 p.m. In Denair, DART service is offered Monday through Friday, from 9:00 a.m. to 4:00 p.m., and on Saturday, from 9:30 a.m. to 3:30 p.m. (City of Turlock 2014)

Bikeways/Pedestrian Circulation

The regional network of bicycle facilities includes a variety of Class I, II, and III bikeways within the cities and communities of Stanislaus County. Class I bicycle facilities are also known as bike paths. Class II facilities are more commonly known as bike lanes, and are designated by striping in paved roads or street right-of-way (ROW). Bicyclists using these facilities share the roadway with cars. The bike lanes are clearly marked and distinguished as guideways for bicycles. Class III facilities are bike routes that share ROW with other vehicles but have no striping or recognizable designation other than signage. No designated bicycle facilities exist within the study area (StanCOG 2014a), but West Main Street is a planned Class III bikeway (Stanislaus County 2011).

Railroads

The California Northern Railroad Company (CFNR) maintains railroad tracks that are located adjacent and parallel to SR 33 within the designated study area.

Existing Traffic Volumes

Daily traffic volumes in Stanislaus County range from more than 138,000 average daily trips (ADT) on SR 99 to more than 16,000 ADT on arterials such as West Main Street to less than 2,000 ADT on local streets (StanCOG 2010). **Table 3.19-1** shows ADT values for road segments near the study area.

Table 3.19-1: Existing Daily Traffic Volumes on Roadways In and Around the Project Area

Roadway	Location	Daily Traffic (ADT)
Sperry Road	SR 33 to Ward Avenue	7,150
SR 33	Ward Ave to Westley, CA	5,042
SR 33	Crows Landing Road to Poppy Ave	3,650

Level of service (LOS) is a measure of the performance of transportation facilities. The Stanislaus Council of Governments defines roadway LOS as one of six LOS designations: A, B, C, D, E, or F (StanCOG 2011). LOS A and B represent free flow or reasonably free flow operations, and LOS E and F represent high levels of congestion and unstable traffic flow. **Table 3.19-2** provides descriptions of each LOS category.

The LOS for the roadways that could be directly affected by the proposed project was not available during preparation of this Draft EIR/EIS; however, the Stanislaus County General Plan (County of Stanislaus 1994) identifies a target LOS of C or better. The local roadways are not typically congested, and so this LOS is likely being met under baseline conditions.

Table 3.19-2: LOS Definitions/Characteristics

LOS	Description
A	Represents free flow. Individual users are virtually unaffected by the presence of others in the traffic stream.
B	Stable flow, but the presence of others in the traffic stream begins to be noticeable.
C	Stable flow, but marks the beginning of the range of flow in which the operation of individual users becomes significantly affected by interaction with others in the traffic stream.
D	Represents high density, but stable flow.
E	Represents operating conditions at or near the capacity level.
F	Represents forced traffic flow or a breakdown in traffic flow.

Parking

Unless otherwise indicated, parking is available to vehicles along the shoulders of county highways within the County ROW, per the Stanislaus County Code.

3.19.2 Regulatory Framework

This section describes laws and regulations at the federal, state, and local level that may apply to the project.

Federal Highway Administration Manual on Uniform Traffic Control Devices

The Federal Highway Administration's (FHWA) Manual on Uniform Traffic Control Devices (MUTCD) is a compilation of national standards for all traffic control devices, including road markings, highway signs, and traffic signals. This document, which has been administered by FHWA since 1971, is updated periodically to accommodate the nation's evolving transportation needs and addresses new safety technologies, traffic control tools and traffic management techniques. The most current version of the MUTCD is dated 2009 and was published in the Federal Register on June 13, 2012 (FHWA, 2014).

Caltrans Transportation Management Plan Guidelines

California Department of Transportation (Caltrans) Transportation Management Plan Guidelines (2009) outlines strategies and guidelines that are needed to minimize traffic congestion during road work activities that are planned along existing Caltrans facilities. The guidelines established in this document identify processes, roles, and responsibilities for all planned construction, maintenance, and permit activities. Incorporation of these strategies in project construction documents and implementation of the strategies are expected to help reduce congestion and manage traffic impacts near work areas.

Stanislaus County General Plan

The Circulation Element of the Stanislaus County General Plan (County of Stanislaus 1994) contains the following relevant policies and implementation measures:

GOAL ONE: Encourage the protection and preservation of natural and scenic areas throughout the County.

> Policy Two: Circulation systems shall be designed and maintained to promote safety and minimize traffic congestion.

Implementation Measure 1: The County shall maintain LOS C or better for all County roadways and intersections, except, within the sphere of influence of a city that has adopted a lower level of service standard, the City standard shall apply.

Implementation Measure 7: Within the spheres of influence of any city, roadway improvements, dedications, building setbacks, and road reservations shall meet the development standards of the city consistent with the Spheres of Influence Policy in the Land Use Element of the General Plan, except in those areas subject to an individual city/county agreement.

Implementation Measure 10: Traffic control devices (e.g., traffic signals), traffic calming, and other transportation system management techniques shall be utilized to control the flow of traffic, improve traffic safety, and minimize delays.

Policy Five: Transportation requirements of commercial and industrial development shall be considered in all planning, design, construction, and improvements.

GOAL TWO: Provide a safe, comprehensive, and coordinated transportation system that includes a broad range of transportation modes.

Policy Seven: Bikeways and pedestrian facilities shall be designed to provide reasonable access from residential areas to major bicycle and pedestrian traffic destinations such as schools, recreation and transportation facilities, centers of employment, and shopping areas.

Implementation Measure 7: Whenever a roadway is resurfaced or restored, adequate pavement shoulder and/or striping will be considered to safely accommodate bicycle travel in accordance with the County Standards and Specifications, the Caltrans Highway Design Manual, or other nationally recognized standard, where adequate right-of-way exists.

Policy Eight: Promote public transit as a viable transportation choice.

GOAL THREE: Maintain a balanced and efficient transportation system that facilitates inter-city and interregional travel and goods movement.

Policy Nine: The County shall promote the development of inter-city and interregional transportation facilities that more efficiently moves goods and freight within and through the region.

Modesto Urban Area General Plan

There are no transporation policies relevant to the proposed project. Operation of facilities would not generate more than 100 peak-hour trips, so a traffic study is not required. Other policies pertain to development of the transportation network within the Modesto urban area and are not applicable to the proposed project.

3.19.3 Impact Analysis/Environmental Consequences

Methodology for Analysis

This section evaluates whether construction and operation of the facilities associated with the proposed project could result in significant impacts related to local transportation and traffic. The analysis is based on a review of various plans, policies, and reports, as well as evaluations of aerial imagery and visits to the study area.

Operational effects would be minimal; pipelines would be buried and vehicle traffic generated by the project would be limited to a very small number of infrequent vehicle trips for pipeline inspection and maintenance. For this reason, this impact analysis focuses on construction-related impacts.

Thresholds of Significance

Consistent with Appendix G of the *CEQA Guidelines*, a traffic impact would be considered significant if the proposed project would:

- Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of a circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersection, streets, highways and freeways, pedestrian and bicycle paths, and mass transit
- Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roadways or highways.
- Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.
- Substantially increase hazards to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).
- Result in inadequate emergency access.
- Conflict with adopted policies regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

Criteria Requiring No Further Evaluation

Criteria listed above that are not applicable to actions associated with the proposed project are identified below along with a supporting rationale as to why further consideration is unnecessary and a no-impact determination is appropriate.

- *Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks* – Activities related to construction and operation of the proposed project would not interfere with air traffic; they would neither require an alteration of air traffic patterns nor result in an increase in air traffic levels.

Impacts and Mitigation Measures

Impact TR-1 Temporary Lane and Road Closures and Potential for LOS Degradation

All pipeline construction would occur within public roadways and other public ROW, private and municipal agricultural lands, and public open space areas. Construction of the pipeline alignments would consist of open-cut construction, except at specific crossings (e.g., river, highway, railroad, and irrigation canals), where trenchless construction techniques would be employed. Equipment, material and vehicle staging would be accommodated either at the construction zones, or at selected off-site locations (e.g., open lots) owned by the Cities of Modesto and Turlock. To accommodate construction equipment and work area, the entire construction corridor (active work area including the trench) would be approximately 45 feet wide. Because of the limited width of the existing roads along this alignment (especially Lemon Avenue, Zacharias Road, and Jennings Road) and the size of the trench and construction zone, it is expected that the construction may require full road closures unless temporary access for construction equipment can be provided along the shoulders of the road and/or adjacent property.

Combined Alignment Alternative

Lemon Avenue and Zacharias Road are narrow, two-lane rural roads that are approximately 20 feet wide with varying widths of shoulders surrounded by agricultural lands. Overhead electrical utility lines are

located along a large portion of these roadways. Residences and other farm-related structures are scattered on parcels along these alignments.

If access can be provided along the roadway shoulders and adjacent property, only partial road closures with appropriate traffic control would be required. The potential exists for pipeline construction along West Main Street, Jennings Road and South Carpenter Road to create lane/road closures requiring detours and other traffic control. Road closures are also anticipated along Lemon Avenue during construction, which would necessitate detours. One segment of trenchless pipe would be required to cross both SR 33 and the CFNR.

Partial or complete closures of roadways could cause a degradation of LOS below acceptable standards, cause roadway congestion, and potentially create roadway hazards. This impact is considered to be potentially significant. Implementation of Mitigation Measure TR-1: Implement a Construction Management Plan to Minimize Interference with Traffic and Emergency Response Hazards would reduce impacts to a level that is less than significant

Separate Alignment Alternative

The impacts caused by the installation of the northern reach of the pipeline would be the same as those described for Alternative 1. Impacts along the southern reach of the pipeline would be similar. In particular, Pomegranate Avenue is a narrow, two-lane rural road that is approximately 20 feet wide with varying widths of shoulders surrounded by agricultural lands. Overhead electrical utility lines are located along a large portion of this roadway. Residences and other farm-related structures are scattered on parcels along the alignment. Installation of the southern reach of the pipeline would result in the closure of Pomegranate Avenue during construction, requiring detours. As in the case of the northern reach, one segment of trenchless pipe would be required to cross both SR 33 and the CFNR.

Impacts under this alternative would be similar to Alternative 1 and would be considered potentially significant. Implementation of Mitigation Measure TR-1: Implement a Construction Management Plan to Minimize Interference with Traffic and Emergency Response Hazards would reduce impacts to a level that is less than significant.

PID Conveyance Alternative

This alternative has a shorter length of pipeline than the Combined and Separate Alignment Alternatives, and the majority of the pipeline would be constructed in existing PID ROW along the Main Canal. Construction in roadways would be limited to about 1.3 miles of pipeline in Bartch Avenue and about 1 mile of pipeline in Ward Avenue. Impacts of construction in these roadways would be similar to those described for The Combined Alignment Alternative. As with the other alternatives, one segment of trenchless pipe would be required to cross both Highway 33 and CFNR. Temporary lane and road closures would be considered potentially significant. Implementation of Mitigation Measure TR-1: Implement a Construction Management Plan to Minimize Interference with Traffic and Emergency Response Hazards would reduce impacts to a level that is less than significant

No Action Alternative

Under the No Action Alternative, neither pipeline construction nor operation would occur. There would be no impacts to transportation and traffic under the No Action Alternative.

Significance Determination before Mitigation

Potentially significant for all action alternatives.

Mitigation Measures

Mitigation Measure TR-1: Implement a Construction Management Plan to Minimize Interference with Traffic and Emergency Response Hazards (Alternatives 1, 2 and 3)

The Partner Agencies (DPWD, the City of Modesto, and the City of Turlock) or the construction contractor, in consultation with the County, will prepare and implement a Traffic Management Plan (TMP). The Partner Agencies will be responsible for ensuring that the plan is adequately developed and implemented. The Partner Agencies will provide the TMP to the Stanislaus County Department of Public Works and Caltrans. The TMP will include recommended traffic-control and traffic-reduction measures as identified in the Transportation Management Plan Guidelines issued by the Division of Traffic Operations Office of System Management Operations (Caltrans 2009). The Partner Agencies will require all traffic-control or traffic-reduction measures described in the TMP to be implemented. In addition, to the extent feasible, construction-related traffic and any temporary road closures shall be scheduled during non-peak traffic periods.

The measures included in the TMP shall be consistent with any applicable guidelines outlined in the Standard Specifications for Public Works Construction, the U.S. Department of Transportation's Manual on Uniform Traffic Control Devices, and the Work Area Traffic Control Handbook. The plan will include the following items:

- Definition of location and timing of any temporary lane or roadway closures;
- Identification and provision for circumstances requiring the use of temporary traffic control measures, such as flag persons, warning signs, lights, barricades, and cones to provide safe work areas in the vicinity of the project site or along the haul routes, including for narrow roadway segments, and to warn, control, protect, and expedite vehicular, bicycle, and pedestrian traffic and access by emergency responders;
- Implementation of comprehensive traffic control measures, including scheduling of major truck trips and deliveries to avoid peak-hour traffic, placement of detour signs (if required), lane closure procedures (if required), flaggers (if required), placement of cones for drivers, and designated construction access routes and access points;
- Notification to adjacent property owners, transit agencies and public safety personnel regarding when major deliveries, detours, and lane closures will occur;
- Measures to address the potential for construction-related traffic to impede emergency response vehicles and a specific training and information program for construction workers to ensure awareness of emergency procedures for project-related accidents;
- Identification of haul routes for movement of construction vehicles that will minimize impacts on vehicular and pedestrian traffic and circulation and safety, and provision for monitoring surface streets used for haul routes so that any damage and debris attributable to the haul trucks can be identified and corrected by the Partner Agencies in coordination with the construction contractor;
- Consideration of other projects in the vicinity that could also affect the same roadways as the project;
- Development of a process for responding to and tracking complaints pertaining to construction activity, including identification of an onsite complaint manager; and
- Documentation of road pavement conditions for all routes that would be used by construction vehicles both before and after project construction. Roads damaged by construction vehicles will be repaired to the level at which they existed before project construction.

Significance after Mitigation

Less than significant.

Impact TR-2 Potential Impacts on Public Transit, Bicycle, and Pedestrian Uses of Affected Roadways

Traffic impacts during construction of the proposed project may include disruption of alternative modes of transportation, such as blocking bicycle or pedestrian access on the shoulders of area roadways. The potentially affected roadways do not have sidewalks or specifically delineated bike lanes. Impacts on transportation and traffic would be temporary in nature but could significantly conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation.

Combined Alignment Alternative

Construction Impacts. STaRT Route 45 West travels along West Main Street Monday through Saturday of each week, and could be affected by lane or road closures of West Main Street or the surrounding roads that may be affected by the construction of the proposed project. Additionally, the shoulders of the roads that may be affected by the proposed project may be used by pedestrians and cyclists, who could in turn be affected by lane or road closures. This impact is considered potentially significant. Implementation of **Mitigation Measure TR-1** would reduce potential impacts on transit, bicycle, and pedestrian uses of potentially affected roadways during the construction phase, and would ensure that impacts would be less than significant.

Separate Alignment Alternative

Impacts would be similar to those of Alternative 1, and are considered potentially significant. Implementation of **Mitigation Measure TR-1** would reduce potential impacts on transit, bicycle, and pedestrian uses of potentially affected roadways during the construction phase, and would ensure that impacts would be less than significant.

PID Conveyance Alternative

The pipeline alignment for this alternative would not affect any public transit routes, but could affect bicycle or pedestrian access along Bartch and Ward Avenues. Impacts would be similar to those of The Combined Alignment Alternative, and are considered potentially significant. Implementation of **Mitigation Measure TR-1** would reduce potential impacts on bicycle, and pedestrian uses of potentially affected roadways during the construction phase, and would ensure that impacts would be less than significant.

No Action Alternative

Under the No Action Alternative, no pipeline construction would occur. There would be no impacts to transportation and traffic under the No Action Alternative.

Significance Determination before Mitigation

Potentially significant for all action alternatives.

Mitigation Measures

See **Mitigation Measure TR-1.**

Significance after Mitigation

Less than significant.

Impact TR-3 Interference with Emergency Access and Circulation

Construction of the proposed project could interfere with the accessibility of roadways to emergency vehicles. Lane closures or full road closures, particularly along limited-width roads such as Lemon Avenue, Zacharias Road, Pomegranate Avenue, and Jennings Road could affect the response time necessary for emergency vehicles responding to emergencies in the area or traveling through the area. Impacts on emergency access and circulation would be temporary in nature but could significantly conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system.

Combined Alignment Alternative

Road closures could result in delays to emergency vehicles traveling on roads that may be affected by construction. This impact is considered potentially significant. Implementation of **Mitigation Measure TR-1** would address the proposed project's potential to interference with emergency access and circulation, reducing this impact to a level that would be less than significant.

Separate Alignment Alternative

Impacts under this alternative would be similar to those of Alternative 1. Road closures could result in delays to emergency vehicles using roads that may be affected by construction. This impact is considered potentially significant. Implementation of **Mitigation Measure TR-1** would address the proposed project's potential to interference with emergency access and circulation, reducing this impact to a level that would be less than significant.

PID Conveyance Alternative

Impacts under this alternative would be similar to those of the Combined Alignment Alternative, though fewer roads would be affected. Road closures could result in delays to emergency vehicles using roads that may be affected by construction. This impact is considered potentially significant. Implementation of **Mitigation Measure TR-1** would address the proposed project's potential to interference with emergency access and circulation, reducing this impact to a level that would be less than significant.

No Action Alternative

Under the No Action Alternative, neither pipeline construction nor operation would occur. There would be no impacts to the access and circulation of emergency vehicles under the No Action Alternative.

Significance Determination before Mitigation

Potentially significant for all action alternatives.

Mitigation Measures

See **Mitigation Measure TR-1.**

Significance after Mitigation

Less than significant.

Impact TR-4 Impacts to Traffic and Circulation from Trip Generation

Project construction would generate vehicle trips for deliveries of equipment and materials and disposal of spoil, and workers would be expected to commute via car from their homes to the work areas. This could result in impacts to traffic and circulation along potentially affected roadways.

Combined Alignment Alternative

Under this alternative, hauling trips could range from zero (for locations not requiring haul of spoil, such as for reconstruction of the pump station), to 83 round trips per day (for pipeline trenching). Worker vehicle trips are estimated to range from 8 to 28 round trips per day. In addition, a maximum of 25 truck trips per day would be required for delivery of imported backfill, pipe, equipment and other materials.

This would introduce a considerable additional traffic volume to existing roadways, many of which are small, rural, and do not have substantial capacity. While the existing traffic volumes on these roadways are generally low, and impacts would be short-term in any particular location, the traffic generated by the project could reduce LOS below acceptable levels and impair traffic circulation. This impact is considered potentially significant. **Mitigation Measure TR-1** would address these impacts by developing a construction traffic management plan, which would identify haul routes, timing, and other factors to reduce impacts. With implementation of this mitigation measure, impacts would be less than significant.

Separate Alignment Alternative

Impacts of this alternative would be similar to those of Alternative 1. Hauling trips could range from zero (for locations not requiring haul of spoil, such as for reconstruction of the pump station), to 71 round trips per day (for pipeline trenching). Worker vehicle trips are estimated to range from 8 to 28 round trips per day. In addition, a maximum of 25 truck trips per day would be required for delivery of imported backfill, pipe, equipment and other materials. This impact is considered potentially significant. **Mitigation Measure TR-1** would address these impacts by developing a construction traffic management plan, which would identify haul routes, timing, and other factors to reduce impacts. With implementation of this mitigation measure, impacts would be less than significant.

PID Conveyance Alternative

Impacts of this alternative would be similar to those of Alternatives 1 and 2, though there would be fewer hauling trips because of the shorter length of pipeline. **Mitigation Measure TR-1** would address these impacts by developing a construction traffic management plan, which would identify haul routes, timing, and other factors to reduce impacts. With implementation of this mitigation measure, impacts would be less than significant.

No Action Alternative

Under the No Action Alternative, neither pipeline construction would occur. There would be no trip generation under the No Action Alternative.

Significance Determination before Mitigation

Potentially significant for all action alternatives.

Mitigation Measures

See **Mitigation Measure TR-1**.

Significance after Mitigation

Less than significant.

Impact TR-5 Damage to Driveways from Open Trench Excavation

Driveways for residences and facilities along the pipeline route could be affected by open trenches that are required to lay the pipelines. Damage to driveways would be temporary in nature and would only occur during the construction phase of the proposed project; however access may be temporarily impeded while the driveway is inaccessible. Upon completion of pipeline installation, affected roadways would be restored per the requirements of Stanislaus County or the private landowner.

Combined Alignment Alternative

Residences and facilities located along South Carpenter Road, West Main Street, Jennings Road, Lemon Avenue, and Zacharias Road that use driveways to access their respective roadways could be affected by open-trenching activities that would occur along these roadways. This is considered to be a potentially significant impact. **Mitigation Measure TR-2: Install Temporary Trench Plates over Open Trenches**

would reduce this impact by providing access to driveways outside of construction work hours. Together with **Mitigation Measure TR-1**, which would include notification of adjacent property owners of planned construction activities, impacts due to interference with driveway access because of open trenching activities would be reduced to a less-than-significant level.

Separate Alignment Alternative

Residences and facilities located along Lemon Avenue, Zacharias Road, and Pomegranate Avenue that use driveways to access their respective roadways could be affected by open-trenching activities that would occur along these roadways. This is considered to be a potentially significant impact. **Mitigation Measure TR-2: Install Temporary Trench Plates over Open Trenches** would reduce this impact by providing access to driveways outside of construction work hours. Together with **Mitigation Measure TR-1**, which would include notification of adjacent property owners of planned construction activities, impacts due to interference with driveway access because of open trenching activities would be reduced to a less-than-significant level.

PID Conveyance Alternative

Residences and facilities located along Bartch Avenue and Ward Avenue that use driveways to access their respective roadways could be affected by open-trenching activities that would occur along these roadways. This is considered to be a potentially significant impact. **Mitigation Measure TR-2:** Install Temporary Trench Plates over Open Trenches would reduce this impact by providing access to driveways outside of construction work hours. Together with **Mitigation Measure TR-1**, which would include notification of adjacent property owners of planned construction activities, impacts due to interference with driveway access because of open trenching activities would be reduced to a less-than-significant level.

No Action Alternative

Under the No Action Alternative, neither pipeline construction nor operation would occur. There would be no impacts to driveways along the above listed roadways under the No Action Alternative.

Significance Determination before Mitigation

Potentially significant for all action alternatives.

Mitigation Measures

See **Mitigation Measure TR-1.**

Mitigation Measure TR-2: Install Temporary Trench Plates over Open Trenches (Alternatives 1, 2 and 3)

During construction of the pipeline, temporary trench plates will be installed over open trenches at the end of each work day.

Significance after Mitigation

Less than significant.

Impact TR-6 Impacts to State Route 33 (SR 33) and California Northern Railroad Company (CFNR) Railroad Tracks

Pipeline crossings of SR 33 and CFNR railroad tracks could result in impediments to highway and rail traffic, respectively. However, trenchless construction methods (horizontal directional drilling (HDD) or jack and bore construction) would be used for crossings of SR 33 and CFNR tracks, which would avoid traffic and circulation impediments to these transportation corridors. HDD and other trenchless tunneling methods are discussed in greater detail in *Chapter 2, Alternatives and Proposed Project/Action*, Section 2.6.2. An easement from Caltrans would be required to construct the pipeline across SR 33 and an access

agreement may be required for railroad crossings. The Partner Agencies would ensure that the proposed project is in compliance with Caltrans and CFNR requirements.

Combined Alignment Alternative

By using trenchless technology, this alternative would avoid impacts to SR 33, CFNR tracks, and related roadway and rail traffic; the impact would be less than significant.

Separate Alignment Alternative

Impacts would be the same as under Alternative 1, and would be less than significant.

PID Conveyance Alternative

This alternative would also include crossings of SR 33 and the CNFR railroad tracks, which are assumed to be constructed using a trenchless method. Impacts would be the same as under Alternatives 1 and 2, and would be less than significant.

No Action Alternative

Under the No Action Alternative, there would be no impacts to SR 33 and CFNR railroad tracks, as construction of the pipeline would not take place.

Significance Determination before Mitigation

No impact.

Mitigation Measures

No mitigation measures are necessary.

Impact TR-7 Impacts to Roadway Surfaces as a Result of Construction Activities

Implementation of the proposed project would involve open trench construction along roadways and roadway shoulders, which would involve cutting into the roadway surface in various locations. Damage to the roadway would be temporary; upon completion of the pipeline installation, affected roadways would be repaved per the requirements of Stanislaus County (Stanislaus County 2014).

Combined Alignment Alternative

Because damage to roadways would be temporary and roadway surfaces would be restored after construction, impacts would be less than significant.

Separate Alignment Alternative

Impacts would be the same as under Alternative 1, and would be less than significant.

PID Conveyance Alternative

Impacts would be the same as under The Combined Alignment Alternative, though there would be less construction in roadways; impacts would be would be less than significant.

No Action Alternative

There would be no impacts to roadway surfaces if the No Action Alternative is implemented.

Significance Determination before Mitigation

Less than significant for all action alternatives.

Mitigation Measures

No mitigation measures are necessary.

Cumulative Impact Analysis

The geographic scope of cumulative impacts related to transportation and traffic includes the project area and surrounding roadways. The proposed project, as well as other projects listed in **Table 3.0-1**, would result in significant cumulative impacts if they collectively adversely affect the same roadways or other transportation infrastructure. Projects listed in **Table 3.0-1** that are relevant to the proposed project are the South County Corridor Study and the West Main Street Highway Improvement project. Although none of the roads that would be affected by the proposed project would be directly affected by roadway improvements during the proposed project's construction phase, it is possible that the intersection of South Carpenter Road and West Main Street will undergo construction starting in 2016, as the roadway widening of the segment of West Main Street from Carpenter Road to Crows Landing Road is scheduled to begin in 2016 (StanCOG 2014c). Roadway widening and associated improvements to the intersection of West Main Street and South Carpenter Road, combined with construction activities required to implement the proposed project, could result in potentially significant cumulative impacts by resulting in lane closures, roadway closures, and construction-related traffic at the same time, increasing congestion on local roadways. The proposed project's contribution would be considerable, and this would be a potentially significant impact.

Mitigation Measure TR-1 would involve preparation of a construction management plan for traffic, which would include consideration of other projects in the development of measures to reduce the traffic impacts of the proposed project, With implementation of this mitigation measure, the contribution of the project to this cumulative impact would be reduced to a level where it would no longer be considerable.

Significance Determination before Mitigation

Potentially significant for all action alternatives.

Mitigation Measures

See **Mitigation Measure TR-1.**

Significance after Mitigation

Less than significant.

3.19.4 References

California Department of Transportation (Caltrans). June 2009. Transportation Management Plan Guidelines. Division of Traffic Operations, Office of System Management Operations. Available: http://www.dot.ca.gov/hq/traffops/systemops/tmp_lcs/files/TMP_Guidelines.pdf. Accessed July 14, 2014.

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Chapter 4 Other CEQA and NEPA Considerations

4.1 Significant and Unavoidable Impacts

As described in Chapter 3, Affected Environment/Environmental Setting, Environmental Consequences/Impacts and Mitigation Measures, there would be no significant and unavoidable impacts from the proposed Project. As such, a Statement of Overriding Considerations for unavoidable, adverse impacts would not be needed. The Partner Agencies would still be required to adopt Findings as part of their approval of the EIR, as there would be a number of potential impacts resulting from the proposed project. The mitigation measures described in Chapter 3, however, would reduce any potentially significant impacts to less than significant.

The No Action Alternative does have the potential to result in significant impacts associated with the lack of a reliable water supply. There is a potential for increased groundwater pumping, which could result in depletion of the groundwater basin. In addition, it is likely that a lack of water supply could lead to the conversion of agricultural land to non-agricultural uses. This would be a significant unavoidable impact.

4.2 Irreversible and Irretrievable Commitments of Resources

Implementation of the proposed project would require irreversible commitment of natural resources including construction materials; labor; and energy required for construction, operation, and maintenance. Commitment of non-renewable natural resources used in construction would include gravel, petroleum products, steel, and others. Commitment of energy resources for construction would include fuel oil, natural gas, and gasoline for heavy machinery. Operation of the proposed project would result in further commitment of energy resources. However, the consumption of energy for construction and operation would not be inefficient, wasteful or unnecessary. The proposed project would support the reuse of recycled water for irrigation in the region, which would otherwise be discharged into the San Joaquin River.

4.3 Growth Inducing Impacts

The California Environmental Quality Act (CEQA) requires the Lead Agency to evaluate whether a proposed Program will directly or indirectly induce growth of population, economic development, or housing construction. Specifically, CEQA Guidelines Section 15126.2(d) states the need to evaluate the potential for a proposed Program to "foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth (a major expansion of a waste water treatment plant might, for example, allow for more construction in service areas)."

Directly induced growth is associated with residential or commercial development projects that would result in a population increase or in an increase in the number of employees. Indirectly induced growth is associated with reducing or removing barriers to growth, or creating a condition that encourages additional population or economic activity. Ultimately, both types of growth induction result in population increase, which "may tax existing community service facilities, requiring construction of new facilities that could cause significant environmental effects" (CEQA Guidelines Section 15126.2[d]). Other potential environmental impacts related to growth include increased traffic, air emissions, and noise; degradation of water quality; loss of sensitive biological and cultural resources; increased demand on public services and infrastructure; and changes in land use and conversion of agricultural or open space to accommodate development.

Under CEQA, growth inducement is not considered necessarily detrimental, beneficial, or of little significance to the environment.

Projects are considered to have growth-inducing implications when economic, housing, or population growth occur either directly or indirectly. Local land use plans (e.g., general plans) provide for development patterns and growth policies that allow for the planned and orderly expansion of urban development (i.e., residential, commercial and industrial uses) supported by adequate urban public services (e.g., water supply, wastewater treatment, solid waste service disposal capacity, police and fire services). A project that would induce unplanned growth (i.e., conflict with local land use plans) could indirectly cause adverse environmental impacts not previously envisioned. Thus, to assess whether a project has the potential to induce growth and result in adverse secondary effects beyond what is anticipated by the local jurisdiction, it is important to assess the degree to which the growth associated with a project would or would not be consistent with applicable land use plan.

Construction of the proposed project would not directly induce population growth, as no new residential or commercial development projects would be served by the project (see *Section 3.16, Population and Housing*). The proposed project would deliver recycled water to existing growers in the Del Puerto Water District Service area (within Stanislaus, San Joaquin and Merced Counties) for agricultural irrigation purposes only. Growers in this region rely heavily on CVP supplies[1] (Reclamation, 2011), augmented by groundwater pumping and surface water transfers, which vary depending on Delta pumping restrictions, drought conditions, and climate change and associated allocations by Reclamation. The proposed project would also not indirectly induce growth (by removing or reducing the barriers to growth) because recycled water would not offset potable supplies in the cities of Turlock or Modesto where the recycled water is derived, or in any of the counties where recycled water would be delivered. Recycled water would be used beneficially for irrigation purposes for existing growers who have unreliable water supply, in lieu of being discharged into the San Joaquin River and being exported out of the region. Recycled water would also supplement supplies to refuges. Delivering non-potable water supply to refuges and to potential users within the Del Puerto service area would not increase existing potable water supplies and thus would not indirectly accommodate additional development within the cities or counties. Thus, impacts of growth inducement are less than significant. Growth inducement impacts would be the same for both Alternatives.

4.4 Environmentally Preferable/Superior Alternative

CEQA requires that an EIR identify an environmentally superior alternative (Guidelines Section 15126.2). The No Action Alternative would not result in any of the physical impacts identified for the proposed project in *Chapter 3, Affected Environment/Environmental Setting, Environmental Consequences/Impacts and Mitigation Measures*, most of which are short-term construction impacts. However, the No Action Alternative could have long-term adverse effects on groundwater resources. Without the proposed project, DPWD would continue to rely on CVP allocations. In years when the full CVP allocation is not available, landowners within DPWD would continue to pump additional groundwater from private wells, which could ultimately lead to overdraft of the groundwater basin and associated effects, including subsidence and water quality degradation. Over the long term, lack of a reliable water supply could also result in conversion of agricultural land to non-agricultural use, which would be an adverse impact. Without the proposed project, the Cities of Modesto and Turlock would continue to discharge treated wastewater to the San Joaquin River, absent an alternative project. Continued discharge would avoid the minor reductions in flows associated with the proposed project, but the discharge of nutrients and salts to the river would continue. Thus, while the No Action Alternative avoids construction impacts, given the long term potential effects on agriculture and on groundwater and surface water resources, it is not considered to be clearly environmentally superior to the proposed project. Additionally, the No Action Alternative would not meet any of the Project objectives.

[1] DPWD has also secured alternate water supplies through temporary water transfers from other agencies or the use of groundwater from privately owned wells.

In both CEQA and NEPA the evaluation of alternatives focuses on identifying alternatives that could minimize environmental impacts. CEQA requires evaluation of alternatives that "feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project" (*CEQA Guidelines, Section 15126.6(a)*). In developing alternatives, the Project Partners originally identified two options for construction of the NVRRWP: the Combined Alignment Alternative and the Separate Alignment Alternative. Because both of these alternatives convey recycled water to the DMC entirely through pipelines, they are collectively referred to as "Pipeline Alternatives". In evaluating impacts of the two Pipeline Alternatives, it was determined that operational impacts were negligible, and the majority of impacts were associated with pipeline construction. In an effort to reduce the impacts of construction, an additional alternative has been considered: the PID Conveyance Alternative. Under this alternative the Cities of Modesto and Turlock would continue their existing discharges to the San Joaquin River, which would function as a part of the conveyance system. Water would be diverted through the Patterson Irrigation District (PID) and conveyed to the DMC through the PID facilities.

Although the PID Conveyance Alternative was developed in an attempt to reduce construction impacts, evaluation of PID facilities showed that the existing PID system does not have sufficient capacity to convey project flows, and expansion of the PID system would be required, including construction of an expanded intake facility and a new pipeline from the intake facility to the DMC. With 30,100 feet of pipeline, the PID Conveyance Alternative does entail construction of less pipeline than the Combined Alignment Alternative (69,800 feet of pipeline) or the Separate Alignment Alternative (64,000 feet of pipeline). However, the two Pipeline Alternatives can avoid impacts associated with construction in the San Joaquin River, while the PID Conveyance Alternative requires in-river construction to expand the existing PID intake. Because of the presence of sensitive resources in the river, including special-status fish, and other species associated with riparian habitat, the PID Conveyance alternative has potentially greater impacts on biological resources than do the two Pipeline Alternatives. In addition, the PID Conveyance Alternative could require construction of future treatment plant upgrades by the Cities of Modesto and Turlock to meet increasingly stringent requirements for discharge to the San Joaquin River. Advanced treatment could require salinity removal, which would produce brine. Impacts associated with these new facilities, especially impacts associated with brine disposal, are potentially significant and unavoidable. The PID Conveyance Alternative is thus not considered to be environmentally superior to the two Pipeline Alternatives.

Comparison of the two Pipeline Alternatives shows that the Combined Alignment Alternative has less impact on the environment than the Separate Alignment Alternative. Impacts associated with both Pipeline Alternatives can be mitigated to a less-than-significant level, but the impacts of the Separate Alignment are greater than the Combined Alignment. This is primarily due to the need to construct two pipeline crossings of the San Joaquin River. Although the crossings would be constructed using trenchless technology, the additional construction that is necessary for the Separate Alignment Alternative results in higher levels of air emissions and GHG emissions during construction. The Separate Alignment also requires more energy for operation, which also results in a higher level of operational GHG emissions.

With two crossings, the Separate Alignment Alternative has more potential impacts on biological resources, because more sensitive habitats are present in the riparian area. There is greater risk of affecting nesting birds, because there would be a greater potential for distractions, noise, and temporary displacement in higher quality nesting areas, including species such as Swainson's hawks, which use the riparian habitat along the river. The Separate Alignment Alternative would also have a greater potential to impact special-status plants that may be associated with habitats in the San Joaquin River, such as slough thistle and Delta button celery. Potential impacts to valley elderberry longhorn beetle would also possibly be greater with two crossings of the San Joaquin River. There would also be a greater chance for impacts to giant garter snakes and western pond turtle that may occur in habitats along the San Joaquin River because there would be two crossings of the San Joaquin River.

The Combined Alignment Alternative is thus considered environmentally superior.

4.5 References

Bureau of Reclamation (Reclamation). 2014. Reclamation Announces Initial 2014 Central Valley Project Water Supply Allocation. February 21. Available at: http://www.usbr.gov/newsroom/newsrelease/detail.cfm?RecordID=46045

Bureau of Reclamation (Reclamation). 2011. Del Puerto Water District Water Management Plan. 2008 Criteria. July 5. Available at: http://www.water.ca.gov/wateruseefficiency/sb7/docs/2014/plans/Del%20Puerto%20WD%20PLAN_DOCUMENT.pdf

Chapter 5 Consultation, Coordination and Compliance

This chapter summarizes public and agency involvement activities undertaken for the proposed project by Reclamation and the NVRRWP Partner Agencies. As noted previously, Bureau of Reclamation (Reclamation) is the lead agency for NEPA compliance, and the City of Modesto is the CEQA lead agency.

The NVRRWP was formed in 2010 as a collaborative partnership between the Cities of Modesto, Ceres, and Turlock, as well as Stanislaus County, and Del Puerto Water District (DPWD). Since that time the Project Partners have engaged with local landowners and organizations on an ongoing basis. The Partners have also consulted with key state and federal agencies regarding the feasibility of the NVRRWP, and to identify environmental issues associated with project implementation. The NVRRWP Project Partners will continue to solicit public and agency input on the project by encouraging review of this EIR/EIS.

5.1 Scoping

The CEQA Notice of Preparation (NOP) and NEPA Notice of Intent (NOI) were released on April 22, 2014, and distributed to 27 agencies. Postcards with information on where the NOP could be viewed and notification of the scoping meeting were also sent to 32 organizations and 84 property owners. The release of the NOP and NOI, along with postings of these notices in the local newspapers and on the websites of Partner Agencies, began the 30-day public review period which ended on May 22, 2014. A joint public scoping meeting for the EIR/EIS was held at on May 13, 2014 at the City of Modesto (2nd Floor Conference Room 2001 at 1010 10th Street). The Scoping Report is included in **Appendix A.**

5.2 EIR/EIS Distribution

Upon completion of the Draft EIR/EIS, the City of Modesto filed a Notice of Completion (NOC) with the State Office of Planning and Research to begin a 60-day public review period, which exceeds the review period required by CEQA (Public Resources Code, Section 21161). Reclamation filed a Notice of Availability (NOA) of the EIS. Concurrent with issuance of the NOC and NOA, this Draft EIR/EIS was distributed to responsible and trustee agencies, other affected agencies, surrounding cities, and interested parties, as well as all parties requesting a copy of the EIR/EIS in accordance with Public Resources Code 21092(b)(3). During the public review period, the Draft EIR/EIS is available for review at the Partner Agencies' main offices, or online at the following locations and links:

City of Modesto, Utilities Department
1010 Tenth Street, 4th Floor
Modesto, CA 95354

City of Turlock
156 S. Broadway
Turlock, CA 95380

Del Puerto Water District
17840 Ward Ave
Patterson, CA 95363

U.S. Bureau of Reclamation
1243 "N" Street
Fresno, CA 93721

Project website: http://www.nvr-recycledwater.org/documents.asp

Appendix H presents the distribution list, which identifies the entities receiving a Notice of Availability of the Draft EIR/EIS.

Agencies, organizations, and interested parties, including those not previously contacted, or who did not respond to the NOP, currently have the opportunity to comment on the Draft EIR during the public review period.

5.3 Future Public Involvement

In accordance with CEQA/NEPA public review requirements, the Draft EIR/EIS has been circulated for public and agency review and comment for a 60-day review period, starting January 8, 2015. During the public review period a meeting will be held on Wednesday, February 11, 2015 at Modesto City Hall, 1010 Tenth Street, Modesto, to receive comments on the Draft EIR/EIS. Comments made at that meeting, along with any written comments received by the City of Modesto or by Reclamation, will be addressed in the Final EIR/EIS, which will be prepared and circulated in accordance with NEPA and CEQA requirements. The City of Modesto will hold a public hearing to consider certification of the EIR.

The Project Partners and Reclamation will use the Final EIR/EIS when considering approval of the proposed project. If the proposed project or another alternative is approved, the Project Partners will make CEQA findings and issue a Notice of Determination and Reclamation will issue a Record of Decision.

5.4 Compliance with Federal Statutes and Regulations

This section describes the status of compliance with relevant federal laws, executive orders, and policies.

5.4.1 Federal Endangered Species Act

Section 7 of the Federal Endangered Species Act (FESA) (16 U.S.C. § 1531 *et seq.*) requires federal agencies, in consultation with and with the assistance of the Secretary of the Interior and or Commerce, to ensure that their actions do not jeopardize the continued existence of endangered or threatened species, or result in the destruction or adverse modification of the critical habitat of these species. Under section 7, if a project could result in incidental take of a listed threatened or endangered species, federal agencies must consult with the United States Fish and Wildlife Service (USFWS) and the NOAA's National Marine Fisheries Service (NMFS) to obtain a Biological Opinion (BO).

Chapter 3.4, Biological Resources, describes the sensitive species that have the potential to occur in the area, and potential effects to federal endangered and threatened species. Impacts to species will be avoided through the implementation of Mitigation Measures, or through measures established in the BO. This EIR/EIS will support section 7 consultation with USFWS and NMFS. Reclamation will not initiate any action that would affect a species federally listed without first completing the appropriate consultation(s) with USFWS or NMFS and receiving formal notice that the action would not jeopardize the continued existence of the listed species or adversely modify designated critical habitat.

5.4.2 Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act (FWCA) of 1934, as amended (16 U.S.C. § 661 *et seq.*) is intended to promote conservation of fish and wildlife resources by preventing their loss or damage, and to provide for development and improvement of fish and wildlife resources in connection with water projects. Federal agencies undertaking water projects are required to fully consider recommendations made by USFWS, NMFS, and State wildlife agencies when any waterbody is impounded, diverted, controlled, or modified for any purpose.

Based on surveys and investigations to be conducted by the federal and state agencies charged with administering wildlife resources, a report addressing any potential impacts to fish and wildlife species and

appropriate mitigation measures would be provided to Reclamation for the Proposed Project. Compliance with FWCA will be coordinated with Endangered Species Act consultation, as described above.

5.4.3 Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) of 1976 as amended (16 U.S.C. § 1801 *et seq*.), is the primary act governing federal management of fisheries in federal waters, from the 3-nautical-mile state territorial sea limit to the outer limit of the U.S. Exclusive Economic Zone. It establishes exclusive U.S. management authority over all fishing within the Exclusive Economic Zone, all anadromous fish throughout their migratory range except when in a foreign nation's waters, and all fish on the continental shelf. The Magnuson-Stevens Act establishes eight Regional Fishery Management Councils responsible for the preparation of fishery management plans to achieve the optimum yield from U.S. fisheries in their regions. The act also requires federal agencies to consult with NMFS on actions that could damage Essential Fish Habitat (EFH) EFH, as defined in the 1996 Sustainable Fisheries Act (Public Law 104-297). EFH includes those habitats that support the different life stages of each managed species. A single species may use many different habitats throughout its life to support breeding, spawning, nursery, feeding, and protection functions. EFH can consist of both the water column and the underlying surface (e.g., streambed) of a particular area. The San Joaquin River in the Study Area is designated EFH for Chinook salmon. As described in *Section 3.4, Biological Resources*, the project is not expected to have adverse effect on fish habitat in the San Joaquin River.

5.4.4 National Historic Preservation Act, Section 106

The purpose of the National Historic Preservation Act (NHPA) (16 U.S. Code § 470) is to protect, preserve, rehabilitate, or restore significant historical, archeological, and cultural resources. Section 106 of the act requires Federal agencies to take into account effects on historic properties. Once an undertaking has been established, the Section 106 review involves a step-by-step procedure described in detail in the implementing regulations (36 CFR Part 800). As described in Section 3.5, Cultural Resources, a historic property survey report for the proposed project was prepared. This analysis includes a Section 106 evaluation for the proposed project. Completion of the cultural resources report and concurrence by SHPO would ensure compliance with the NHPA.

5.4.5 Clean Air Act

The U.S. Congress adopted general conformity requirements as part of the Clean Air Act (CAA) Amendments in 1990 and the USEPA implemented those requirements in 1993 (Sec. 176 of the CAA (42 U.S.C. § 7506) and 40 CFR Part 93, Subpart B). General conformity requires that all federal actions "conform" with the State Implementation Plan (SIP) as approved or promulgated by USEPA. The purpose of the general conformity program is to ensure that actions taken by the federal government do not undermine state or local efforts to achieve and maintain the national ambient air quality standards. Before a federal action is taken, it must be evaluated for conformity with the SIP. All "reasonably foreseeable" emissions predicted to result from the action are taken into consideration. These include direct and indirect emissions, and must be identified as to location and quantity. If it is found that the action would create emissions above de minimis threshold levels specified in USEPA regulations (40 CFR § 93.153(b)), or if the activity is considered "regionally significant" because its emissions exceed 10 percent of an area's total emissions, the action cannot proceed unless mitigation measures are specified that would bring the proposed Project/Action into conformance. As described in *Section 3.3, Air Quality*, the study area lies within the San Joaquin Valley Air Basin. The results of the air quality modeling showed that NOx emissions could exceed Federal General Conformity significance thresholds. With implementation of Mitigation Measure AIR-1 (reduce NOx emissions), impacts would be reduced to less than significant. Thus, the project is in compliance with this Act.

5.4.6 Coastal Zone Management Act

The Coastal Zone Management Act (CZMA) (16 U.S.C. § 1451 *et seq.*), passed by Congress in 1972 and managed by the National Oceanic and Atmospheric Administration's (NOAA) Office of Ocean and Coastal Resource Management, is designed to balance completing land and water issues in coastal zones. It also aims to "preserve, protect, develop, and where possible, to restore or enhance the resources of the nation's coastal zone." Within California, the CZMA is administered by the Bay Conservation and Development Commission, the California Coastal Conservancy, and the California Coastal Commission. No portion of the proposed project is within the coastal zone, as the study area is located approximately 70 miles east of the coast. Therefore the Coastal Zone Management Act does not apply to the proposed project.

5.4.7 Farmland Protection Policy Act

The Farmland Protection Policy Act (FPPA) (7 U.S.C. § 4201 *et seq.*) requires a federal agency to consider the effects of its actions and programs on the nation's farmlands. The FPPA is intended to minimize the impact of federal programs with respect to the conversion of farmland to nonagricultural uses. It assures that, to the extent possible, federal programs are administered to be compatible with state, local, and private programs and policies to protect farmland. As described in *Section 3.1, Agriculture and Forestry Resources*, no long term conversion of farmland to non-agricultural use would occur. There could be temporary impacts to soil resources during construction where activities would occur within agricultural land, but such effects would be mitigated to less-than-significant levels with implementation of Mitigation Measure AG-1. Thus, the project would be in compliance with this Act.

5.4.8 Executive Order 11988 – Floodplain Management

Executive Order (EO) 11988 requires federal agencies to recognize the values of floodplains and to consider the public benefits from restoring and preserving floodplains. Because pipelines would need to cross under the San Joaquin River, there would be facilities located within the floodplain, but the buried pipelines and associated small appurtenances such as air release valves, would not increase flood hazards or interfere with floodplain management. The NVRRWP and Reclamation have considered Executive Order 11988 in their development of this EIR/EIS and have complied with this order.

5.4.9 Federal Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act, and Executive Order 13168

The Migratory Bird Treaty Act (16 U.S.C. §§ 703-712) and the Bald and Golden Eagle Protection Act (16 U.S.C. §§ 668-668c) prohibit the take of migratory birds (or any part, nest, or eggs of any such bird) and the take and commerce of eagles. EO 13168 requires that any project with federal involvement address impacts of federal actions on migratory birds. As described in *Section 3.4, Biological Resources*, the proposed project could have potential to impact burrowing owls and tricolored blackbirds. However, with mitigation measures BIO-9 and BIO-10, impacts would be reduced to less than significant. *Section 3.4* also evaluated the impacts on golden eagle and bald eagle and determined that potential impacts on these species would be less than significant. Thus, the lead agency would be in compliance with this EO.

5.4.10 Executive Order 13112: Invasive Species

EO 13112 directs all federal agencies to prevent and control introductions of invasive non-native species in a cost-effective and environmentally sound manner to minimize their economic, ecological, and human health impacts. As directed by this EO, a national invasive species management plan guides federal actions to prevent, control, and minimize invasive species and their impacts (NISC 2008). To support implementation of this plan, the U.S. Army Corps of Engineers (USACE) has recently released a memorandum describing the U.S. Army Corps of Engineers Invasive Species Policy (USACE 2009). This policy includes addressing invasive species effects in impact analysis for civil works projects. No

invasive species that warrant removal have been identified in the study area. In areas where revegetation is required, use of native species will be required so as to insure that invasive non-native plant species are not introduced to the area. Discharge of recycled water would not entail any risk of introducing invasive aquatic species to the DMC. The project would thus be in compliance with this EO.

5.4.11 Executive Order 11990 – Protection of Wetlands

Under EO 11990, federal agencies must avoid affecting wetlands unless it is determined that no practicable alternative is available. The EO directs federal agencies to provide leadership and take action to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands in implementing civil works. As described in *Section 3.4, Biological Resources*, wetlands likely occur in the study area. A jurisdictional wetland delineation will be conducted to evaluate each drainage on a case-by-case basis. The delineation will be submitted to USACE for verification. Mitigation measures have been identified to reduce potentially significant impacts to less than significant levels. These include avoidance of federally protected wetlands to the extent possible through alignment adjustments and use of trenchless construction techniques, compensatory mitigation for losses of aquatic resources, and measures to reduce impacts of a frac-out. Thus, the lead agency would be in compliance with EO 11990.

5.4.12 Wild and Scenic Rivers Act

The Wild and Scenic Rivers Act (6 U.S.C. § 1271 *et seq.*) was passed in 1968 to preserve and protect designated rivers for their natural, cultural, and recreational value. There are no designated Wild and Scenic Rivers within the study area, nor will any designated rivers be adversely affected by the proposed project. As such, the Wild and Scenic Rivers Act does not apply to the proposed Project/Action.

5.4.13 Safe Drinking Water Act - Source Water Protection

Section 1424(e) of the Safe Drinking Water Act (42 U.S.C. § 300f *et seq.*) established the USEPA's Sole Source Aquifer Program. This program protects communities that have no alternative source of water from groundwater contamination from federally-funded projects. Within USEPA's Region 9, which includes California, there are nine sole source aquifers. None of these sole source aquifers are located within the proposed project study area (USEPA, 2014), therefore the Sole Source Aquifer Program does not apply to the proposed project, and the lead agency is in compliance with Section 1424(e) of the Safe Drinking Water Act.

5.4.14 Executive Order 13195 - Trails for America in the 21st Century

The EO on Trails for America requires federal agencies to protect, connect, promote, and assist trails of all types throughout the United States. The proposed project would not result in any impacts on trails. Thus, no adverse effects on trails would occur and the lead agency is in compliance with this EO.

5.4.15 Executive Order 13007 - Indian Sacred Sites

Sacred sites are defined in EO 13007 (May 24, 1996) as "any specific, discrete, narrowly delineated location on Federal land that is identified by an Indian tribe, or Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion; provided that the tribe or appropriately authoritative representative of an Indian religion has informed the agency of the existence of such a site." The proposed project would not be located on or impact any Federal lands and therefore would not affect any Indian sacred sites.

5.5 Cooperating Agencies

Under NEPA cooperating agencies are agencies other than the lead agency that have jurisdiction by law or special expertise with respect to the environmental impacts expected to result from a proposed project.

For the NVRRWP, the following agencies are cooperating with Reclamation in preparation of the EIR/EIS:

- City of Modesto, the lead agency for CEQA and one of the partners in the NVRRWP
- DPWD, a partner in the NVRRWP
- USFWS, responsible for biological consultation regarding effects on terrestrial and freshwater aquatic species
- NMFS (cooperating agency agreement pending), responsible for biological consultation regarding effects on anadromous fish

In addition, Reclamation is consulting with the USACE regarding necessary permits under Section 404 of the Clean Water Act. The USACE has designated Reclamation as the NEPA lead for permitting under both section 7 and Section 106.

5.6 References

United States Environmental Protection Agency (USEPA). 2014. Pacific Southwest, Region 9. 2014. Ground Water – Sole Source Aquifer. Last updated September 25, 2013. Available at: http://epa.gov/Region9/water/groundwater/ssa.html

Chapter 6 EIR/EIS Preparers

A list of persons who prepared or reviewed various sections of the EIR/EIS, prepared significant background materials, or participated substantially in preparing the EIR/EIS is presented below.

6.1 North Valley Regional Recycled Water Program Partner Agencies

City of Modesto, CEQA Lead Agency

William Wong, P.E.	Engineering Division Manager, Utilities Department
Larry Parlin, P.E.	Director of Utilities
Richard Ulm, P.E.	Former Director Utility and Planning Projects

City of Turlock

Michael Cooke	Municipal Services Director
Dan Madden	Former Municipal Services Director
Garner Reynolds, P.E.	Regulatory Affairs Manager

Del Puerto Water District

Anthea Hansen	General Manager

City of Ceres

Michael Brinton, P.E.	Deputy Director of Public Works

6.2 EIR/EIS Preparation Team

Table 6-1: List of Preparers

Name	Qualifications	Project Role
Bureau of Reclamation, NEPA Lead Agency		
Scott Taylor, Repayment Specialist	M.S. Economics, 6 years experience	Project Manager
Ben Lawrence, Natural Resource Specialist	B.S. Chemical Engineering, 16 years experience	NEPA Review- South-Central California Area Office
Liz Vasquez, Natural Resource Specialist	M.S. Environmental Science and Management, 10 years experience	NEPA Review- Mid-Pacific Regional Office
Jennifer Lewis, Wildlife Biologist	B.A. Biology, Ph.D. Entomology, 5 years experience	Review: Biology
Mark Carper, Archaeologist	M.A. Archaeology, 15 years experience	Review: Cultural Resources
Mary Johannis, Deputy Regional Planning Officer	B.S. Civil Engineering, Professional Engineer, 20 years experience	Review: Energy
Lisa Rainger, Geologist	B.S. Geology, 27 years experience	Review: Geology
Michael Mosley, Physical Scientist	B.S. Geological and Environmental Science, 6 years experience	Review: Water Quality
Tim Rust, Fish and Wildlife Program Manager	B.S Biology, M.S. Environmental Engineering, 34 years experience	Review: Refuges and Water
Chris Eacock, Project Manager/Soil Scientist		Review: Water Quality
Patricia Rivera, Native American Affairs Program Manager	B.A. Social Work, Anthropology, and Sociology; M.S. Public Policy and Administration; J.D., 8 years experience	Review: Indian Trust Assets
Andrea Meier,Natural Resource Specialist	B.S. Environmental Toxicology, M.S. Public Policy and Administration, 12 years experience	Review: Project Description
David Woolley, Land Resource Specialist		Review: Recreation
RMC Water and Environment		
Robin Cort	B.S. Biology, Ph.D. Ecology; over 30 years experience in water resources planning, environmental documentation and permitting	Manager of EIR/EIS preparation
Lyndel Melton	M.S. Environmental Engineering, B.S., Civil Engineering: Over 36 years experience in civil, environmental and water resources planning and design and environmental compliance	Project Manager and Technical Reviewer
Carrie Del Boccio	M.S. Environmental Engineering, B.S., Civil Engineering, Education Abroad; Over 9 years experience in water planning and treatment design, pipeline design	Project Engineer

Sue Chau	B.A. Environmental Science; over 15 years experience in water resources including water/wastewater treatment, storage, conveyance, and water supply, CEQA and NEPA compliance and water planning	Population and Housing; Growth Inducement
Katie Cole	M.S. Environmental Science and Management, B.S. Sociology and Environmental Studies; 1 year experience in water resources planning	Land Use, Energy, Geology and Soils, Public Services and Utilities, Hazards and Hazardous Materials,
Phoebe Grow	M.S. Environmental Management, B.S. and B.A.; Over 10 years experience in environmental engineering in water resources planning, regulatory compliance, environmental permitting, stormwater management, and regional watershed planning	Hydrology and Water Quality
Reza Namvar	Ph.D. Civil Engineering, M.S., B.S.; Over 19 years experience in environmental and water resources planning, management and engineering, development and application of groundwater flow and contaminant transport models	Groundwater analysis
Ryan Doyle	B.S. Civil and Environmental Engineering; Over 1 year experience water resources planning and design to groundwater modeling and remediation	GIS
Lindsey Wilcox	B.S. Environmental Resources and Forest Engineering; Over 8 years experience in water resource planning and permitting	Document preparation
Basin Research		
Colin Busby	Ph.D. Anthropology, 38 years cultural resources management experience	Cultural Resources, Historic Property Survey Report
Donna Garaventa	Ph.D. Anthropology, 35 years experience in cultural resources assessment	Cultural Resources, Historic Property Survey Report
Horizon Water and Environment		
Michael Stevenson	M.S., Environmental Science, 17 years experience in environmental compliance	Technical oversight, QA/QC
Kevin Fisher	M.S., Ecology, 14 years experience in biological assessments	Biological Resources
Jen Schulte	Ph.D., Chemical Engineering, 8 years experience in air and noise impact assessment	Air Quality, Global Climate Change/GHGs, Noise
Allison Chan	M.S., Environmental Management, 7 years experience in environmental analysis	Aesthetics
Jacob Finkle	B.S., Environmental Sciences, 3 years experience in environmental analysis	Traffic/Transportation
Patrick Donaldson	M.S., Environmental Management, 3 years experience in environmental analysis	Environmental Justice, Agriculture and Forestry Resources
Pam Rittlemeyer	M.A., Geography, 6 years experience in environmental analysis	Recreation
Catherine Schnurrenberger	M.S. Ecology, 24 years experience in environmental analysis	Biological Resources
Brian Piontek	M.S., Environmental Management, 3 years experience in environmental analysis	Biological Resources
Corrina Lu	M.A., Geography, 13 years experience in environmental analysis	Biological Resources
Paul Glendening	B.A., Geography, 13 years experience in environmental analysis	GIS
Scott Walls	MLA, 6 years experience in environmental analysis	Biological Resources

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